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1931—
A Decisive Year in Textiles

THIS year will be one of the most critically decisive years in the history of the American textile industry.

A great opportunity, and a great danger, confront the industry.

The opportunity consists of the chance to consolidate the sound progress made during recent years, and particularly during 1930; and to translate that progress into terms of greater prosperity for management and wage-earners.

The danger is two-fold. There will be a temptation to let down; to consider the co-operative job done. There will be an equally natural impulse to lean too heavily upon the centralized props which have been set up; to expect institutes and associations to produce profits for individual mills.

Either alternative will be fatal. A year of smugness or of inaction will scrap the results of five years of effort.

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The textile industry has not been engaged in a socialistic experiment. It has not set up a central organization which can do the thinking or the working for manufacturers. It has not raised an umbrella which will protect the weak at the expense of the strong.

It has merely created for itself an opportunity to effect a scientific approach to production and distribution technique—an opportunity which exists per se in those industries controlled by a relatively few strong units.

It has provided for the development of accurate statistical data; for the examination of the fundamentals upon which its manufacturing technique is based; for the dissemination of sound principles of cost finding; for the scientific cultivation of new markets, both domestic and foreign; for the elimination of trade abuses.

The results of such fundamental activities must be applied individually if they are to be reflected in financial statements. Their existence does not automatically bring success to any mill, strong or weak.

The significance of this fact has been realized by many progressive manufacturers who have joined in cooperative activities at a temporary loss to themselves—not out of a spirit of philanthropy or brotherly love, but because they knew there was no assurance of continuing or permanent success for them so long as they were identified with an industry whose production and distribution status was chaotic.

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For a decade, the textile industry has been derided as a chronically sick giant, producing one of the primary necessities of life yet failing to provide a decent living for its hundreds of thousands of participants and workers.

During the latter months of 1930, public opinion changed. The industry was hailed for its courage; for the example it set to its younger, and apparently stronger, brother industries.

What will be said about textiles this time next year? The answer rests with each individual manufacturer. And in that answer will be found a forecast of the industry's fortunes during the next decade.

That is why 1931 is a decisive year in textiles.

Douglas G. Woolf
Editor

The Year in Textiles

as Reflected in This Issue

During 1930, the textile industry has been building a stronger edifice. Using as mortar clearer thinking, it has cemented together certain keystones of sound principles and actions. The resulting structure promises to resist the corroding action of unfavorable business tides in the future.

In laying its plans for 1930 TEXTILE WORLD anticipated this building program on the part of the industry. It drew up specifications, which were published in the first issue of the year. It tried to make each succeeding issue a keystone in its own structural effort, that of recording, interpreting and inspiring the industry's progress.

Similarly, in planning this Annual Review and Forecast Number, the editors attempted to cement together, in proper balance, all these keystones. They offer this issue as a capstone for their year's work. They hope it represents not only an accurate record of 1930 events, but a guide for action in 1931.

This issue deals with principles, not details. It high-lights basic trends, rather than specific events. The following analysis of its contents will help the reader visualize its purpose and scope.—*Editor.*

Balancing Production to Demand

Rate of textile mill operation in 1930 was approximately 22% below 1929 and 16% below 1928. Partly due to slackened buying but also represented intelligent effort to keep production in line with demand. Many constructive influences at work. Decks being cleared for action. *(page 80)*

Washington Watches Textiles

Conference early in year between textile leaders and Government officials helped to develop construction action. Both President Hoover and Secretary Lamont impressed with progress the industry is making. *(pages 84, 85)*

Textiles to Lead Recovery

Textile industries are in position to lead in the general business recovery, says Dr. Haney. He would not be surprised to see 15c. cotton before end of 1931. Wool manufacturers should be able to do larger business at better profit. Silk market probably touched bottom last October. *(page 86)*

Night Work

Move to eliminate night employment of women and minors in cotton mills not later than March 1, now supported by majority of industry, regarded as most constructive and far-reaching step taken. *(page 90)*

Cooperative Activities

New mental attitude in textile industry is the most encouraging factor in present situation. Was responsible for many constructive developments in cotton branch, says George Sloan. Wool industry discarding its traditions, says A. D. Whiteside. *(pages 92, 93)*

Mergers

Out of mass of rumor regarding textile mergers, enough fact can be extracted to indicate further trend toward combinations. Fine cotton goods field was in the spotlight, but in all branches there was development. *(page 94)*

Merchandising-Mindedness

Necessity is forcing revolution in textile distribution. Some manufacturers have achieved merchandising-mindedness in remarkably short space of time. New executive personnel of American Woolen Co. cited as one of the examples of this trend. *(page 96)*

Exports

First large-scale cooperative attempt to cultivate foreign outlets for textiles reflected in formation in 1930 of Textile Export Association of the U. S. (cotton goods) and American Textile Trading Co. (mercerized yarns), both under Webb-Pomerene Act. New possibilities are opened up. *(page 98)*

Tariff

Effect of new tariff on textile imports obscured by world-wide business depression. Statistics show no major trends directly traceable to enactment of law in June. *(page 99)*

Costs

Cotton mills have become cost-minded. They have found that keenly competitive conditions intensify need for sound methods of cost finding. Throughout the industry, uniform approach to problem grows. *(page 100)*

Southern Industrial Relations

Constructive influences at work to put employer-employee relations in South on more substantial basis. Despite Danville strike, now over, which was accorded national publicity, indications are there is progress in development of sounder labor situation. *(page 102)*

Research

Textile industry carried preliminary organization work, in fundamental technical research, to successful conclusion during one of the worst business depressions ever experienced. Progressive mental attitude is encouraging. A scientific-minded industry will be the most valuable result. *(page 104)*

Textile Consumption in Industry

Increased consumption of textiles in major industries, and many important new uses of textile products for industrial application, indicated in symposium of trends for 1931. *(page 106)*

Installment Buying of Machinery

Need for modernization, if manufacturers are to compete, calls for some method whereby mills can secure needed equipment, for replacement purposes. A plan for financing machinery purchases through established credit mediums. *(page 109)*

Textile Machinery Sales

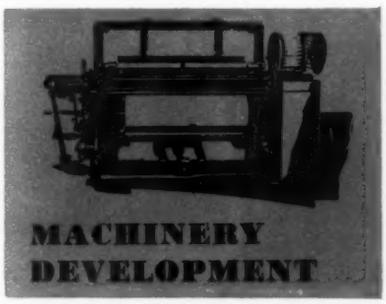
Dollar volume of textile machinery sales in 1930 approximately one-third less than 1929. Majority of reports from makers indicate improved demand in latter part of year, for replacement purposes, and expectation of expansion of business in 1931. *(page 110)*

Textile Machinery Developments

Year was marked by unusually broad progress in improvement and re-design in all branches of textile equipment. A survey of 1930 trends. *(page 112)*

Obsolesence

Slim profit margins have left no room for covering up inefficient production. An up-to-date plant is a prerequisite to successful conduct of business today. Conclusions drawn to date from series of articles on methods used in combating wear and obsolescence. *(page 116)*



Credits

Always a delicate problem, credit has been a particularly trying one in 1930—and will be until we are completely out of the general business depression. Caution is urged for 1931—but it is as unwise to become panicky as to be incautious. *(page 118)*

Cotton Manufacturing

Greater receptivity to improved machinery, and better management, involving more efficient use of equipment in place, have resulted in reduction of cotton manufacturing costs. *(page 120)*

American Cotton Threatened

Gain in volume and quality of foreign cottons threatens domination of American crop. Producers in this country must consider developments abroad carefully, in formulating programs to make cotton-growing here more profitable. *(page 122)*

Woolen Spinning

Replacement of old cards; application of new attachment whereby slubs for novelty yarns can be made during the original carding; and substitution of frames or new mules for old mules are among the outstanding machinery trends in woolen spinning. Mills which modernize will realize on their investments. *(page 124)*

Worsted Spinning

Worsted spinners must redouble their efforts to make wool spin up instead of down. Demand for fine counts is increasing, and calls for more accurate spinning. Depends more upon men than machines. *(page 125)*

Wool Weaving

The almost unbelievable results of the automatic loom in speeding up production in the plainer class of wool goods may be duplicated in fancy goods field in the near future through development of loom with speed of 150 to 160 picks per minute, adaptable for pick-and-pick shuttling. *(page 126)*

Cooperative Wool Marketing

National Wool Marketing Corp. has made a good start. Evaluation of its results is difficult and controversial, but opinion is that it has helped a complicated, depressed manufacturing situation. *(page 127)*

Silk Throwing

Growth of silk industry, multiplicity of grades of silk used, and increasingly exacting requirements of buyers have transformed throwster into a fine technician. Continued research and plant improvement necessary if progress is to be maintained. *(page 128)*

Silk Weaving

Radical improvements have been made in silk looms. Machinery 15 or more years old should be junked. Looms from five to 10 years old can be placed in shape to compete. To keep a share of the business, weaver must have courage to rebuild his machinery and plant. *(page 129)*

Raw Silk Toboggan

Collapse carried raw silk prices to new low but, in turn, stimulated silk consumption here to record extent in final months of year. Progressive improvement in Japanese situation indicates foundation has been laid for more stable market. *(page 130)*

Technique of Rayon Use

Successful use of fine-denier rayons, both alone and in combination with silk, has been one of gratifying developments in last year. Others include use of large-sized skein; introduction of high-speed warpers designed especially for rayon; and improvements in equipment for sizing synthetic fibers. *(page 132)*

Rayon Manufacture

Increased plant efficiency and intensive research noted in technical progress of rayon production—both stimulated by bitter competition. Rumors of entirely new synthetic fibers continue. *(page 133)*

Rayon Output

Domestic rayon production in 1930 estimated at 119,000,000 lbs.; world output at 426,700,000 lb. Year marked by chaos, involving price-cuts, both formal and informal. *(page 134)*

Style in Knit Goods

Color variation was leading factor in style trends in knit goods during 1930. Many fashion changes developed, some of which promise to be important in 1931. *(page 136)*

Knitting

Demand for grenadine hosiery (given birth by fad of wearing stockings wrong side out); impetus given to manufacture of run-resistant knitted rayon fabric; revival of interest in full-fashioned hosiery in one operation; and trend toward greater standardization, were among the outstanding 1930 developments in knitting technique. *(page 138)*

Wet Processing

Wide-spread adoption of pre-shrinking methods in cotton finishing; introduction of the continuous kier; improvements in wool-scouring process; iron-proofing acetate yarns; and wrinkle-proofing rayon fabrics, are some of developments in wet processing paving the way for future progress. *(page 141)*

Continuous Bleaching

Advantages of continuous bleaching are obvious. Machinery builders contributed to progress in 1930. Further progress up to chemist. *(page 144)*

Power and Engineering

"What are my power and steam costing me?" is the question a textile executive must ask. Results of research are being applied to power generation and engineering—and the textile industry profits thereby. *(page 146)*

Mill Construction

Engineering brains have contributed to progress of plant modernization. Mill construction must be planned to provide the most satisfactory accommodations for productive equipment. A survey of current trends in constructing and equipping textile plants. *(page 149)*

Market Reviews and Forecasts

Concise analyses of outstanding 1930 developments and trends in individual branches of textile markets, and their bearing on outlook for 1931. *(page 159)*

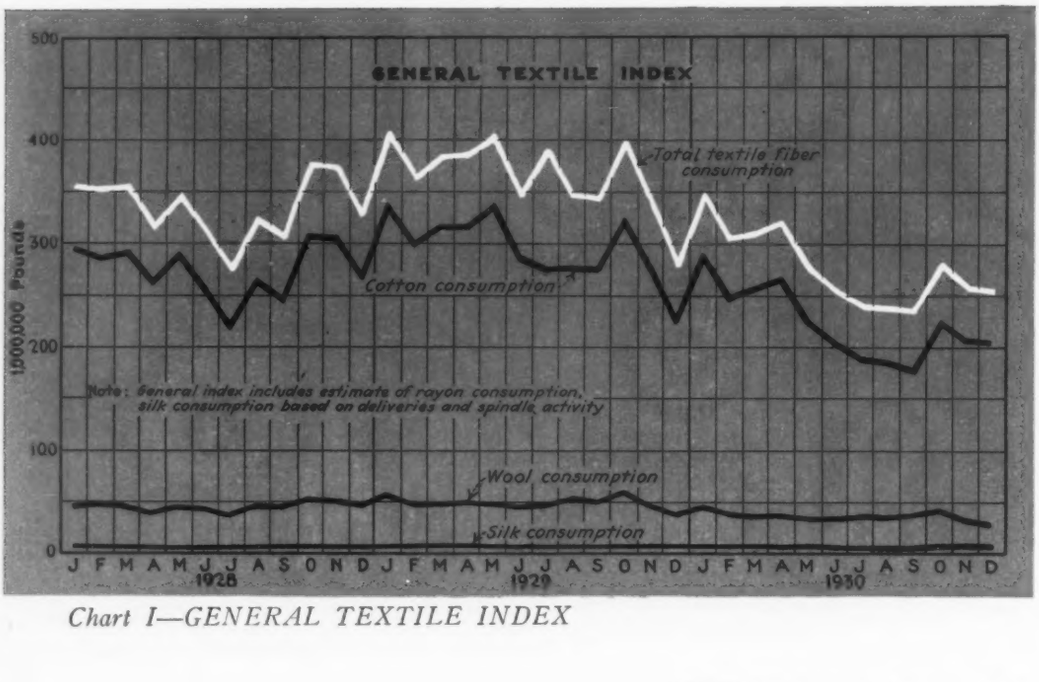

GENERAL TEXTILE INDEX
Total textile fiber consumption
Cotton consumption
Note: General index includes estimate of rayon consumption, silk consumption based on deliveries and spindle activity
Wool consumption
Silk consumption
1,000,000 Pounds
500
400
300
200
100
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart I—GENERAL TEXTILE INDEX

Decks Being Cleared for Action

Statistics of Textile Industry Reveal

THE best estimate which can be made for the diversified textile industry as a whole places 1930 production at about 22% below 1929 and 16% below 1928. As these figures take into consideration almost everything except the population of Samoa, the details of derivation will not be laboriously set forth. By a similar statistical process, the low point in 1930 is placed, as far as textiles are concerned, along in September, and figures show that improvement since that time has been better than seasonal.

Considered purely from the standpoint of mill operation the drop of 22% in production is nothing to cheer about. Examination of the background for the figures, however, reveals certain extremely constructive elements which are discernible even to those who cannot be classed as chronic seekers of the silver lining. Keeping in mind the past tendency of the industry to overproduce, the cut in production during 1930 represents not only a slackened demand but also a sound, intelligent effort to keep production in line with demand. Witness:

1. Cotton cloth sales for the last six months of 1930 were 172,322,000 yd. in excess of production.

2. Hosiery sales for the seven months ended Oct. 31 were 1,362,000 doz. pairs above production.

3. Underwear sales for the four months ended Oct. 31 were 454,000 doz. garments above production.

4. While varying factors make it impossible to present accurate statistics for wool fabrics and silk fabrics, indications are that the stock situations were in far sounder positions during the last six months of 1930 than in the first six months; this means intelligent curtailment.

Naturally, the items mentioned do not represent the only factors in the picture, for otherwise textile manufacturers would be enjoying excellent profit margins, but they do represent what is probably the most constructive effort the industry has ever made to avoid over-production. Greater results only await further application of the principles.

Cotton Goods in Come-Back

The sequence of events in cotton goods illustrates vividly the results of both the lack of, and the applica-

tion of, sound curtailment policies. The statistical chronicle runs as follows:

1. Cotton goods started the year with a hangover. Stocks at the end of December, 1929, were far higher than the yearly average for any year for which statistics are available.

2. Although production dropped during the first six months of 1930 curtailment was evidently not on a sound basis, since production exceeded sales during the period. Prices were chaotic.

3. About July effective curtailment began to take place. When a buying wave hit the market in Septem-

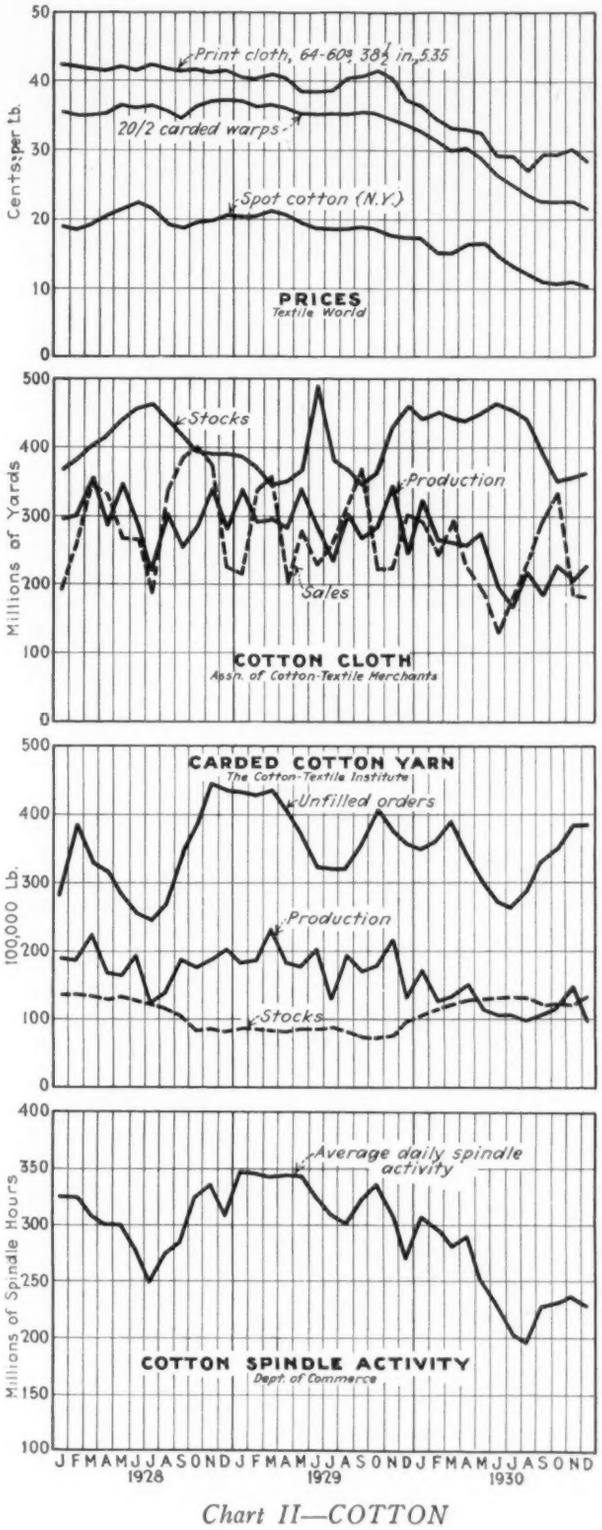


Chart II—COTTON

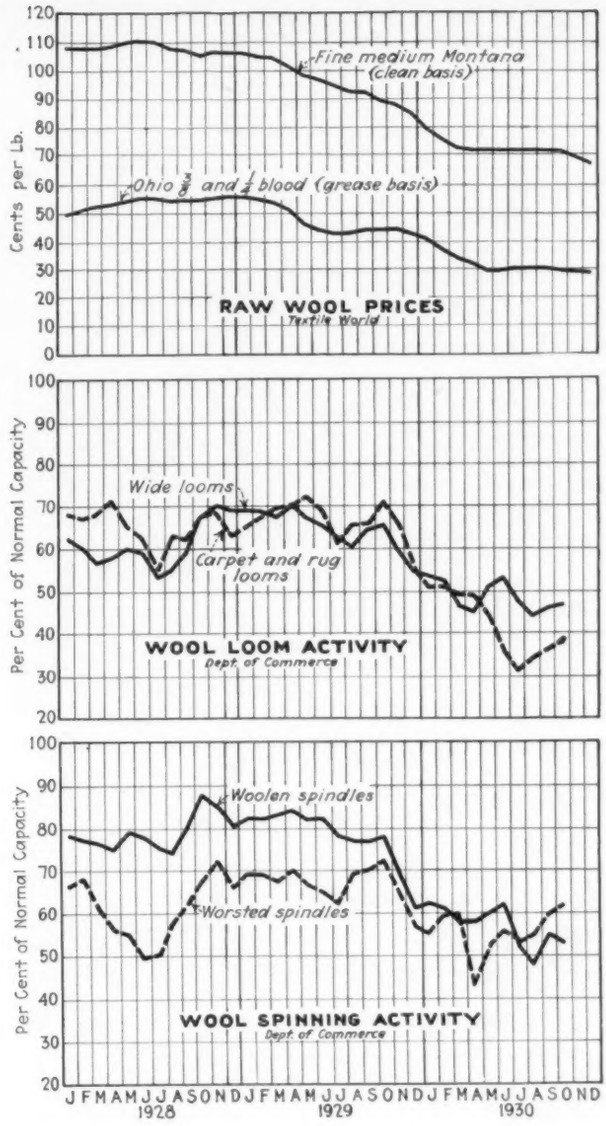

Fine medium Montana (clean basis)
Ohio ⅜ and ¼ blood (grease basis)
Cents per Lb.
RAW WOOL PRICES
Textile World
Wide looms
Carpet and rug looms
Per Cent of Normal Capacity
WOOL LOOM ACTIVITY
Dept. of Commerce
Woolen spindles
Worsted spindles
WOOL SPINNING ACTIVITY
Dept. of Commerce
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart III—WOOL

ber and October, stocks were radically reduced. Manufacturers' margins increased and the textile industry was hailed throughout the country as the little child which was to lead the climb from the valley of depression.

4. We wish that we could end the story with the last paragraph, but, alas, this is a statistical article, not a story book. Just enough overconfidence was generated to make the course of the market during November and December a series of short old-time price-cutting sprees followed by reform. A factor was that production exceeded sales by 74,962,000 yd. for the two months. The inescapable conclusion from a study of the date, however, is that cotton goods ended the year in a far sounder position than it started. Stocks were 97,000,000 yd. less and the inclination to really fight for a price was far more prevalent. The statistical position, however, is far from perfect when all the "ifs," "ands," and "buts" so dear to the heart of the statistician are included. Further effort in balancing production to demand would not only be beneficial but is absolutely essential.

Combed yarn production was curtailed drastically during 1930. Activity was on a basis of about 53%

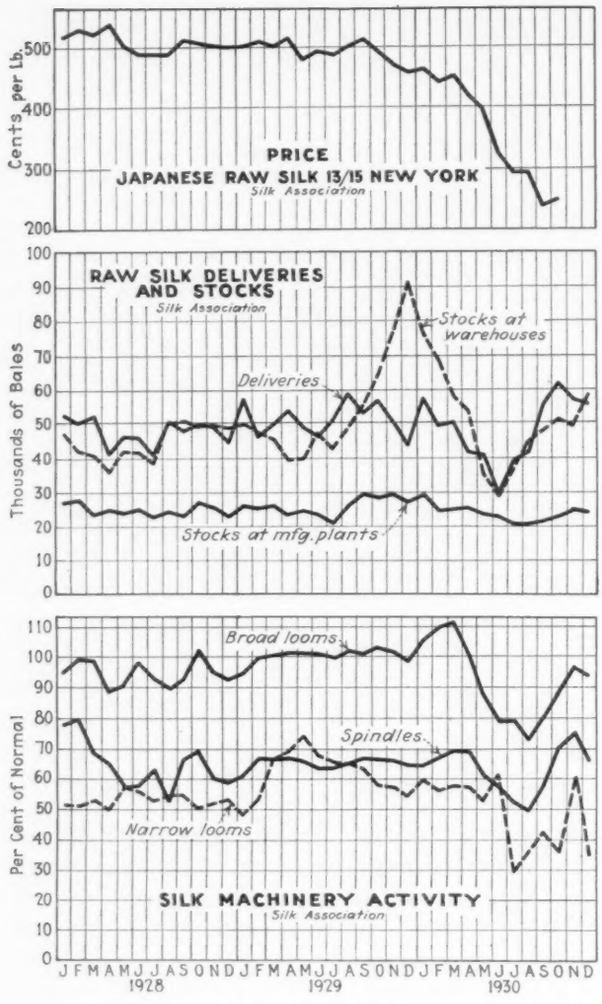

PRICE
JAPANESE RAW SILK 13/15 NEW YORK
Silk Association
Cents per Lb.
RAW SILK DELIVERIES AND STOCKS
Silk Association
Thousands of Bales
Stocks at warehouses
Deliveries
Stocks at mfg. plants
Broad looms
Spindles
Narrow looms
Per Cent of Normal
SILK MACHINERY ACTIVITY
Silk Association
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart IV—SILK

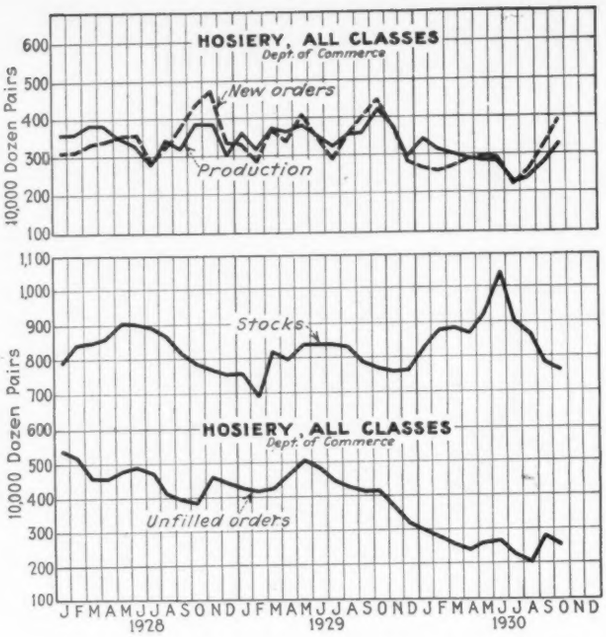

HOSIERY, ALL CLASSES
Dept. of Commerce
10,000 Dozen Pairs
New orders
Production
Stocks
HOSIERY, ALL CLASSES
Dept. of Commerce
Unfilled orders
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart V—HOSIERY

of normal operation. This short time operation made difficult going for the spinners, but the further demoralization of disastrously high stocks was avoided.

Carded yarn stocks averaged about 30% higher during 1930 than would have been sufficient, considering the volume of business. The relation of stocks to unfilled orders, however, was far better in October (the last month for which figures are available), being in the ratio of 1:3 as against the ratio of 1:2 prevailing in midsummer.

The best indication of general activity in the cotton division of the industry lies in spindle activity. For the 11 months ended Nov. 30, 1930, the average daily spindle activity was 252 million spindle hours, representing a drop of 23.6% from the corresponding period in 1929, and 16% from 1928.

Wool Industry Has Greatest Slump

Despite the relatively smaller group, the wool industry showed no such concerted action in tackling the curtailment problem as was evident in the cotton group. The wool industry was marked by the contrast between the running schedules of mills which ran full blast and those which barely staggered along. It was also marked by an exceptionally bad year. The varying number of manufacturers who report on such items as yardage production makes any statistical analysis difficult, but available figures indicate that the low point was reached around the early part of July. The increase in activity since that time can practically all be attributed to seasonal factors, and about the only bright spot in the hand-to-hand combat is that stocks were reasonable at the year end. This in itself, however, is an indication that the problem of balancing production to demand has been receiving honest, though largely individual, attention.

Considering the wool industry as a whole—with all due allowances for the difficulty of any such broad consideration—activity was about 28% below 1929, and 24% below 1928, for the first ten months of each year, which is the largest slump experienced in any of the major textile branches.

Silk Machinery Fairly Active

The welfare of the silk industry during 1930 has been closely allied with the sensational drop in raw silk which established a new all-time low in price. The hulking figure of overproduction in Japan coming at a time of depression in this country; the measures applied to remedy the situation; the future prospects; are all covered elsewhere in this issue. From the standpoint of the observer the important point is that silk was the first of the textile raw materials to show a real come-back. From the low in early October the price had snapped back about 20c. per lb. by the year-end.

Disregarding for the moment the tremendous losses in inventory occasioned by the drop in raw silk, the low price was a major factor in supporting activity in the silk industry at a figure far above that prevalent in the other branches of the textile industry.

To be specific: Silk spindle activity was only about 5.3% below 1929, which was a banner year as far as silk consumption is concerned. Broad loom activity was about 9% less for the first ten months of 1930 as compared with 1929. Narrow looms took the greatest drop, being off about 21% for the first ten months of 1930 as against 1929.

For the whole year 1930 silk deliveries showed a recession of only about 6%. The climb in raw silk prices since October contains a moral about limiting production to demand, but that, after all, is a Japanese story. So far as the domestic situation in fabrics is concerned,

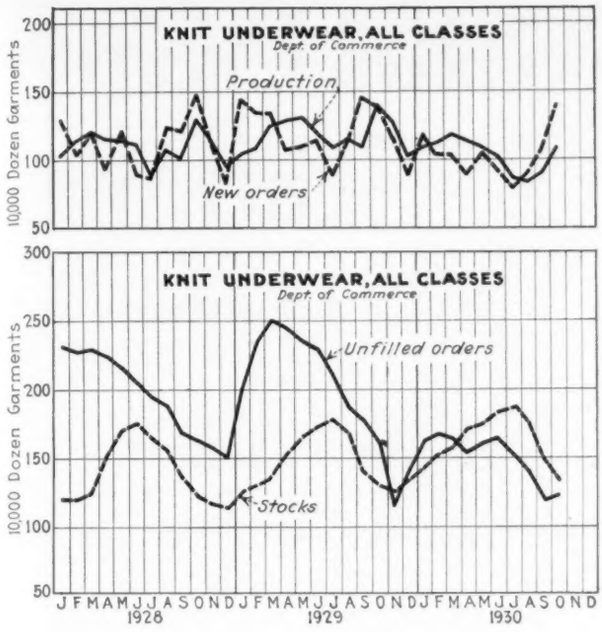

KNIT UNDERWEAR, ALL CLASSES
Dept. of Commerce
Production
New orders
10,000 Dozen Garments
KNIT UNDERWEAR, ALL CLASSES
Dept. of Commerce
Unfilled orders
Stocks
10,000 Dozen Garments
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart VI—UNDERWEAR

statistics do not yield much. The market tone, however, is one of moderate confidence.

Rayon

And then, as the story goes, they came to rayon. Discounting all factors, including the general business depression, there can be little doubt that, considering the elements in their favor, rayon producers made a fairly poor job of 1930. And this is said from the standpoint of those who have cheered the progress of rayon through all these years.

The chart tells the story of rayon production. It does not tell the story that probably in excess of 20,000,00 lb. were piled up in stock by the end of the year.

Ups and Downs in Knitting

Last November the National Association of Hosiery and Underwear Manufacturers issued a warning that business would be poor and advised members to curtail production. Unfortunately, many responded by shouting "bigger'n better than ever." During the first *three* months only of 1930, production was 2,302,000 doz. pairs in excess of sales. Market conditions showed the results. For the *seven* months ended Oct. 31, however, sanity prevailed and orders were 1,362,000 doz. pairs above production. Again market conditions showed the results, but the first three months' spree still hung over the market.

For the ten months ended Oct. 31, hosiery production was 19% under 1929 and 15% under 1928.

The situation in knit underwear was not quite so difficult. Production for the first ten months of 1930 was somewhat under 13% less than during 1929, and somewhat over 5% less than during 1928. The tendency to tackle the problem of balancing production to demand is again in evidence. Production was 550,000 doz. garments in excess of sales for the first six months of 1930, but for the four months ended Oct. 31, production was 454,000 doz. garments less than sales.

The Why and the Where

It is not within the scope of a statistical article to list the agencies and individuals which are responsible for

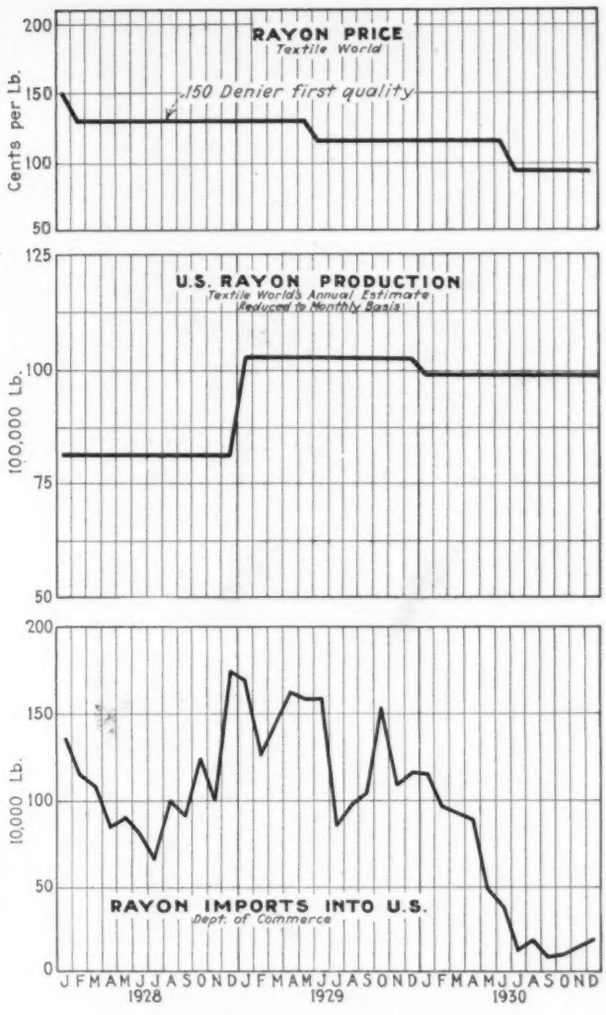

RAYON PRICE
Textile World
150 Denier first quality
Cents per Lb.
U.S. RAYON PRODUCTION
Textile World's Annual Estimate
(Reduced to Monthly Basis)
100,000 Lb.
RAYON IMPORTS INTO U.S.
Dept. of Commerce
10,000 Lb.
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1928
1929
1930

Chart VII—RAYON

the drive to balance production to demand during 1930. Suffice it to say that credit is given where credit is deserved.

If, then, the textile industry has done such a good job from the statistical standpoint in limiting production, why are more reasonable profit margins not in evidence? The answer lies in the following:

1. Despite the fact that the stocks of cotton goods were reduced 97,000,000 yd. during the year, unfilled orders were 142,062,000 yd. less at Dec. 31, 1930, than the previous year, and 179,905,000 yd. less than Dec. 31, 1928. In other words, much remains to be done.

2. Despite the fact that hosiery production was 1,362,000 doz. below orders for the seven months ended Oct. 31, the previous three months saw an overproduction of 2,302,000 doz.; which leaves a net deficit of 940,000 doz. pairs.

3. Underwear orders exceeded production by 454,000 doz. garments for the four months ended Oct. 31, but production exceeded orders by 550,000 doz. for the first six months, which means a total of 96,000 doz. produced in excess of sales for the ten month period.

Obviously, then, the year 1930 should be divided into two parts: The period ended somewhere in mid-summer where producers went ahead and produced, and the period ended with the year-end where producers made an intelligent effort to limit production. Statistics will show that improvement during the latter part of 1930 was better than seasonal, both as regards volume and as regards manufacturing margin.

Textile Progress at Wash

By Paul Wooton, Washington Corres

President Hoover Sees Promise of Prosperity

ACTION of the textile industry in developing statistical data on production and demand; in initiating an investigation into the premises on which manufacturing technique is based and in correcting fundamental weaknesses in employment policies, has made a most favorable impression on President Hoover.

During his eight years as Secretary of Commerce, Mr. Hoover fought for the adoption of one fundamental principle in American business: the importance of ascertaining facts and of developing plans and policies on the basis of those facts. Consequently it is a source of deep gratification to him that the textile industry, during the last year, has made such signal progress in broadening the bases of its factual information.

To him, it is particularly significant that an industry, apparently handicapped by the weight of age and tradition, should throw off the shackles and align itself with the most progressive modern movements.

In the future courageous prosecution of these forward-looking movements, President Hoover sees a promise of prosperity for the industry and its wage-earners, compatible with its size and its importance in our national life.

Arouses Interest ington

Correspondent, TEXTILE WORLD

Secretary Lamont Impressed with Achievement

THE Department of Commerce naturally has followed developments closely in the textile industry since the conference with leaders of that industry last January. Secretary Lamont is impressed with their accomplishments in 1930.

He sees as outstanding steps taken in the cotton division of the industry the individual and voluntary regulation of the maximum number of hours in the workweek, and the wide endorsement given to the movement to eliminate night employment of women and minors. He believes these steps are symptomatic of a new attitude now prevailing in all divisions of textile manufacture.

The Department of Commerce is organized to lend aid to business men and industrialists in their attempts to improve their own conditions.

Helpfulness from that quarter is limited by the extent to which business lays plans to help itself.

A feature of the 1930 textile development which is particularly gratifying to Secretary Lamont has been the existence of this very determination on the part of the industry to correct its current weaknesses from within.

Textiles Likely to Lead Business Recovery

By Dr. Lewis H. Haney

Director, New York University Bureau of Business Research, and Editor, "Textile World Analyst"

THE year 1930 saw a continuation of one of the most severe business recessions on record. After attempts to stimulate business in the early months, a general slump carried prices and production in most industries below the bottom levels of 1921. (Figs. 1 and 2).

The causes of all major busiess recessions are to be found in the booms which precede them, and 1930 was no exception. The year 1929 marked the culmination of one of the greatest inflationary periods in history, the inflation centering in the stock market and real estate. We now know, however, that commodity prices in many important cases had been maintained far above levels justified by supply and demand. Industrial production was about as far above normal as it ever gets, (Fig. 1) and capacity to produce was excessive in most industries. Huge stocks of numerous commodities piled up.

This condition was facilitated and stimulated by great inflation in bank credit, with loans far above normal with reference to deposits, and an excessive turnover of deposits.

The business history of 1930 is merely a record of the liquidation and deflation required by these conditions, made worse by a *concurrent* recession throughout the world, badly distributed supplies of monetary gold, a collapse in silver prices and Oriental exchanges, unwise tariffs, obstinate attempts at price maintenance, Government tampering with markets for wheat, cotton, and wool, and much misguided optimism. (Had any large part of our most influential spokesmen frankly recognized that conditions at the beginning of 1930 were fundamentally unsound, many errors might have been avoided and the necessary readjustment have been made more smoothly.)

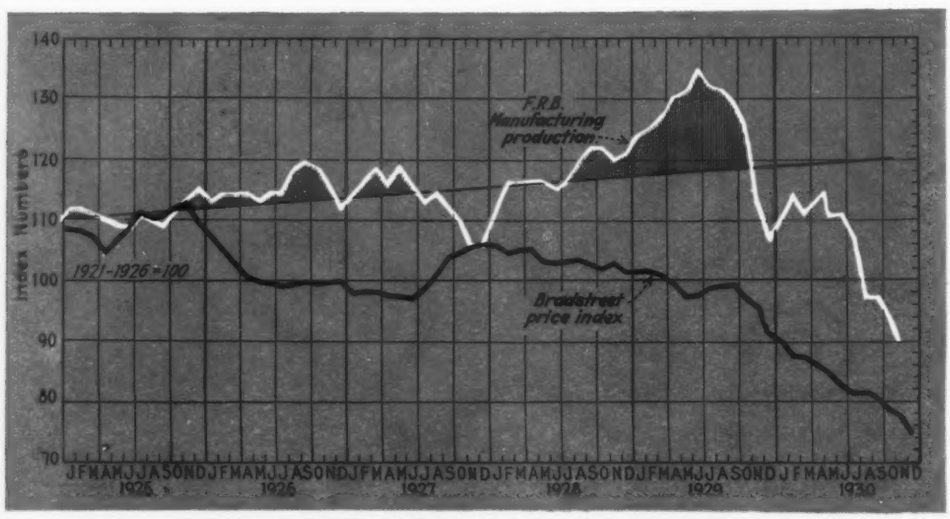


Fig. 1—PRODUCTION AND PRICES

Industrial Production—Average Daily, Adjusted for Seasonal Variation, Federal Reserve Board; Commodity Price Index—End of Month, Bradstreet's Journal. Average 1921-1926 = 100 for both indexes.

As it is, the 1930 record shows total industrial production about 18% below 1929, railway freight tonnage about 14% lower, and automobile production down about 35%, and building activity down 42%. The total production activity in the chief textile industries in 1930 was about 22% lower than in 1929. At the end of the year, we found industrial activity about 30% below estimated "normal," a figure which probably also applies to cotton mill consumption.

General Outlook for 1931

The outlook for 1931 develops from the foregoing facts. Obviously business is nearing the bottom of the recession, but just as obviously it takes time to complete so great a process of deflation and liquidation. At the beginning of the year, moreover, we find that process still incomplete in several respects. Many common stocks are thoroughly deflated and brokers' loans are low, but some of the leading stocks are still maintained at levels which appear unreasonable, and the total security loans of the banks are still high. The prices of finished goods are

hardly readjusted to the low levels established for raw materials. Current production has been curtailed sufficiently to warrant the statement that shortages are "in the making" (ultimately), but it has not been kept curtailed long enough to allow the liquidation of excessive commodity stocks. Dividend cuts, failures, low interest rates, and unemployment and greatly reduced payrolls exist; but so does the old level of dollar wage rates.

It seems, therefore, that the first half of the year 1931 must be spent in completing the job of readjustment. In the first quarter, average commodity prices and industrial production—*with due allowance for seasonal conditions*—are likely to be a little lower. Much progress, however, has been made toward liquidation and the beginning of recovery is only a question of time. No proven barometers have yet indicated positively an upturn, and in the absence of such evidence, the forecaster must rely on precedent and general economic reasoning. On these bases, one may choose between three possibilities as to the date of recovery, according to one's optimism, namely, March, June, or November. There is precedent for any one of the three, and each may be argued for with some show of logic. Our opinion is that the bottom of the recession may be expected by spring, that stabilization should be worked out during the summer, and recovery come in the fall.

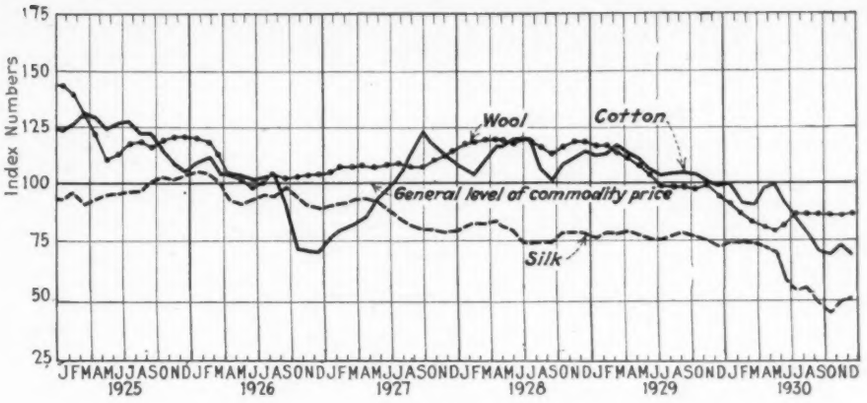


Fig. 2—TEXTILE PRICE LEVELS

Chart shows how chief textile fibers compare (1) with the general level of commodity prices and (2) with each other. The 100 line = average of all commodity prices, and fibers are normally priced when near the general level. The several fiber price curves are so placed that normally they should be close together.

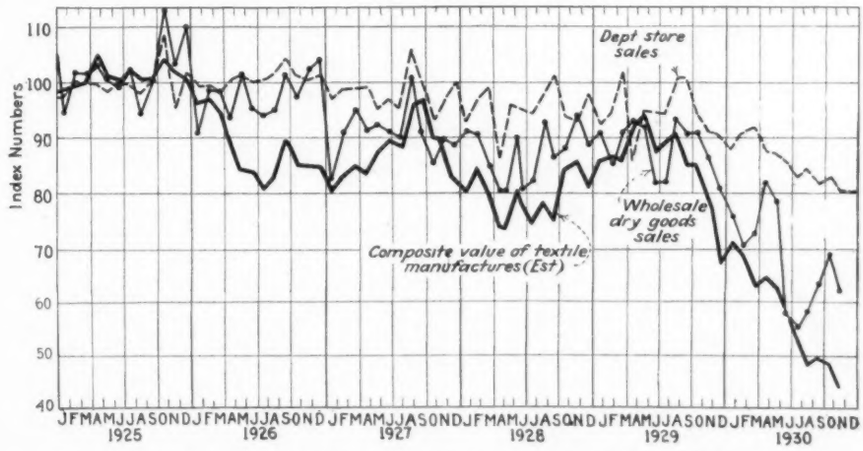


Fig. 3—GENERAL TEXTILE BAROMETER

Wholesale Dry Goods Sales—Adjusted for seasonal variation; 1922-1926 Average = 100; (Federal Reserve Board) Dep't Store Sales—Adjusted for seasonal variation and long-time trend; (Federal Reserve Board index which allows for revised seasonal and number of days used from Oct., 1929, on) Composite Value of Textile Manufactures (Estimated)—Weighted Composite of Cotton, Wool, and Silk Machinery Activity adjusted for seasonal variation and price levels (N. Y. University, Bureau of Business Research).

The chief danger at present seems to lie in the possibility of a premature inflationary spurt early in the year, which would be followed by a relapse in the fall, thus delaying the ultimate sustained recovery. But if the patient remains in bed till really able to get up, recovery in the second half seems reasonably probable. The recovery from so severe a business sickness is likely to be irregular and slow. We note, too, that the failure of commodity prices to recover with production so far below its old long-time trend (see Fig. 1) may indicate that a new and less-upward trend has been established to mark the degree of business activity in the next few years.

The Textile Industries

As anticipated, the general trend in textile manufacturing industries was downward until the middle of 1930 (Fig. 3). A year ago the Analyst hoped for a normal recovery in the second half. As a matter of fact, the textile industries tried, as it were, to make such a recovery; but the force of a general business recession, world-wide in scope, was too much for the constructive forces. In August, September, and October last year, wholesale dry goods sales rose (Fig. 3). In September and October the composite activity in cotton, wool, and silk manufacturing increased, and a spurt in wool manufacturing came even earlier; but signs of over-production soon appeared and in November curtailment was again in evidence except for silk manufacturing.

The great trouble has been on the demand side, and it found expression in prices (Fig. 2). Thus the estimated value of the textile output recovered but little in September and actually decreased in October and November to a new low level (Fig. 3). While the volume of textile manufacturing in 1930 was 22% below that in 1929, the estimated value was 33% lower. We also note that department store sales (adjusted for normal growth and seasonal variation) held barely steady in the August-October period and declined in November and December (see Fig. 3).

It now seems highly probable that the textile industries are in a position to lead in the general business recovery when that comes. The wool manufacturing industry appears to be well liquidated and this is true for the most part in cotton and to a less extent in silk. In general, dealers', and probably consumers', stocks of goods are low. Ordinary clothing prices are relatively cheap again. Certainly the raw materials, especially silk and cotton are low (Fig. 2). The textile industries await only a revival in consumer demand, which in turn depends upon employment, farm crops and prices, the development of clothing shortages, and a less pessimistic spirit. As clothes wear out and prices become stabilized, the basis

ior the increased demand will appear. A rise in the employment curve will be a positive forecast.

Cotton

The year 1930 was one of decreasing cotton mill consumption, increasing available supplies of raw cotton, declining prices, and the lowest level of replacement margins found in many years. The estimated total value of cotton textiles produced, was about 38% lower than in 1929.

As to raw cotton, we must face the fact that for the current crop year we have a total supply of American cotton amounting to upwards of 20 million bales. There is a strong probability that there will be about the same total supply at the end of the present season. The outlook for domestic consumption and foreign demand is unusually uncertain, especially in view of the fact that the *decline in world consumption during recent years has been chiefly in American cotton.* It seems now that the best guess as to the movement of cotton during the current season is as follows: Domestic consumption is likely to be under 5 million bales, say 4.5 to 4.8 million. Exports seem likely to run not over 10 million bales,—more probably between 8.5 and 10 million, or say 9 million bales. This would make a total disappearance of between 13 and 14.5 million bales, say around 14 million bales. On such assumptions, the domestic carryover at the end of the season is likely to be around 5 million bales, of which 3 to 4 million bales will apparently be financed by the Government. This is consistent with the recent guess by Tattersall, which places the world carryover of American cotton at the end of the year at 9 million bales (which is the largest since the 1920-21 season, when it was 9.6 million bales). If world consumption of American cotton is to be only 11.4 million bales and consumption outside the United States only 6.5 million bales, as Tattersall estimates, there would inevitably be a very large storage in foreign countries, with a weak foreign demand for American cotton in 1931-32. Even a 20% cut in the next crop, reducing it to 11.4 million bales, taken alone, would not bring much strength.

In order to strengthen the cotton market, *what is needed is an increase in consumption.* A United States crop of 11.4 million bales, *together with a world consumption of 14 million bales* in 1931-32, would bring real improvement. A general business recovery throughout the world, with higher silver prices, is about the only thing short of a crop failure, that can bring much of an advance. This thing we anticipate some time in the second half of 1931. Accordingly, moderately higher cotton seems probable. While it is impossible to forecast definitely under existing conditions, *the Analyst would not be surprised to see 15c cotton before the end of 1931.*

As bearing on the demand for cotton, we present a new chart (Fig. 4) based on the cotton cloth figures published by the Association of Cotton Textile Merchants. These figures are adjusted for seasonal variation. Base line shows average for 1926-28.

The curve representing stocks of standard cotton cloth is inverted, or upside down. It indicates that stocks of cloth recovered from the low point of March, 1927, to a high point in September, 1928, since when they have been above average (and the inverted stocks curve has been low). The stocks then dipped to April, 1929, but were large from November, 1929, until August, 1930. At the end there was a decline, and in November the stocks were only 20% above average as compared with 55% above average in August. This represents a *trend* toward improvement and a better balance between supply and demand.

The unfilled orders as adjusted tend to lead the trend of the inverted stocks curve. They increased from August, 1930, on, rounding off somewhat at the end.

Wool

Some improvement in wool manufacturing occurred in the second quarter of 1930, but the year closed with the *value* of production at the lowest level since 1921. The wool industry has been following the trend of general business rather closely; it is not likely that any sustained improvement will be seen before the spring.

The industry has suffered from declines in the price

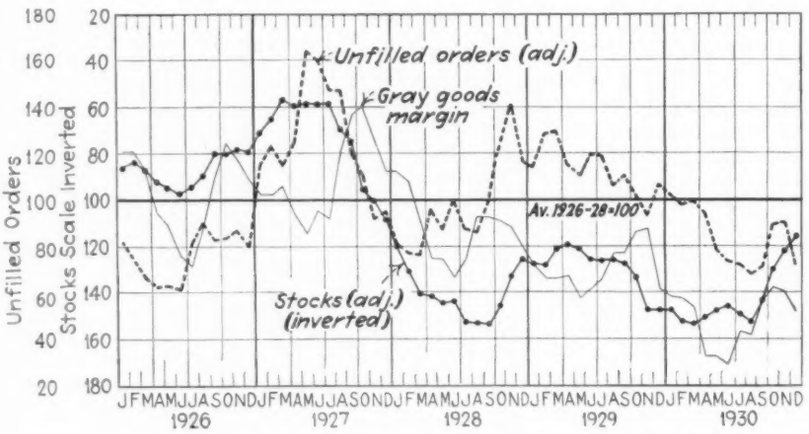


Fig. 4—COTTON CLOTH BAROMETER

Unfilled Orders, Stocks (inverted) adjusted for seasonal variation, Cotton Textile Merchants. Gray goods replacement margin based on TEXTILE WORLD Indexes. Average for 1926-1928 = 100 for all three indexes.

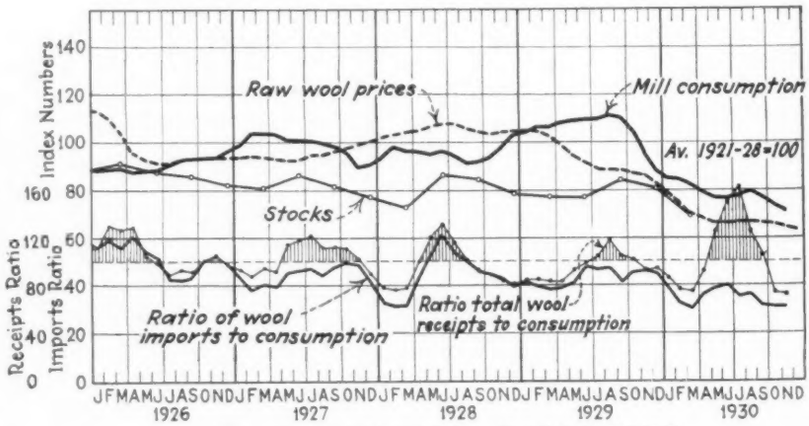


Fig. 5—RAW WOOL BAROMETER

Price—TEXTILE WORLD Index: Mill Consumption—Grease Equivalent, Average Daily Adjusted for Seasonal Variation, 3 Month Moving Average; Stocks—U. S. Total, Grease equivalent, End of Quarter, Adjusted for Seasonal Variation. Ratio of Total Raw Wool Receipts in the U. S. to Mill Consumption—Receipts not reduced to grease equivalent, adjusted for Seasonal Variation, Consumption as above, 3 Month Moving Average. Average for 1921-1928 = 100 for all four indexes, Ratio of Raw Wool Imports to Mill Consumption—Imports not reduced to grease equivalent, Adjusted for Seasonal Variation, Consumption as above, Average 1921-1928 = 50, 3 month moving average.

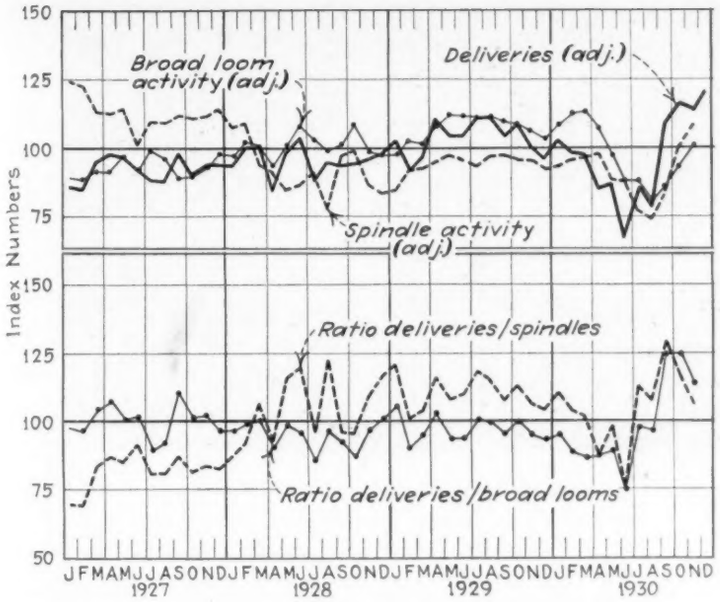

Broad loom activity (adj.)
Deliveries (adj.)
Spindle activity (adj.)
Ratio deliveries/spindles
Ratio deliveries/broad looms
Index Numbers
150
125
100
75
50
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1927
1928
1929
1930

Fig. 6—INDICATED SILK CONSUMPTION

Deliveries—bales; Spindle Activity, Broad Loom Activity—per cent of normal machine hours operated. All three indexes adjusted for seasonal variation. Ratio of Deliveries to Spindles and Ratio of Deliveries to Broad Looms based on above indexes. Average of 1927-1929 = 100 for all indexes. Source: Silk Association of America.

of the raw material. The TEXTILE WORLD index of raw wool prices in December was 24% below a year ago, (Fig. 5), but from June on did not fall as much as the general level of prices (Fig. 2). Prices abroad were weaker than domestic, while financial difficulties and weak exchange rates for southern hemisphere countries intensified the declines in foreign markets. The new tariff helped to check imports during 1930, but domestic prices are nearing parity as 1931 opens.

Apparently we are at a peak of world wool production. A decrease is likely now that wool and animal prices are low and slaughterings will ultimately reduce the sheep population. But 1931 will probably witness only the beginning of this change. Meanwhile, artificial methods are being used in an effort to halt the down trend of prices. If prices are allowed to find their natural level promptly, the goods manufacturers who have kept their houses in order, should be enabled to do a larger business at a better margin of profit as soon as general business improves.

The Analyst presents in Fig. 5 another new index bearing on the wool situation, illustrated by the curve of estimated total monthly receipts in the United States, adjusted for seasonal variation and *figured as a percentage of the domestic mill consumption for the month.* This is especially timely in view of the discontinuance of figures on wool stocks. The total wool receipts curve was above its average relation to mill consumption (on a 1921-28 base) last year from May through October. This fact indicated an accumulation of stocks, and the more strongly in that such indications have agreed with the figures on stocks formerly published. This new curve appears to be a good barometer of domestic wool prices. We must allow, however, for the trend of mill consumption as a separate market factor.

At the end of the year, mill consumption pointed downward. The ratio of receipts to consumption had fallen below average, but wool prices were still low and declining (Fig. 2). It can be said, that the total receipts have declined below an average relation with mill consumption, and this holds out hope for a better balance and a reduction in surplus stocks.

Wool mill consumption is at the lowest rate since February, 1921, and wool prices are the lowest since November, 1921. With current receipts now in balance with consumption, it seems reasonable to conclude that after some further recession in the early part of the year, raw wool markets may be expected to stabilize by spring and to recover by fall at the latest. The year 1931 should see a definite turn for the better in the wool manufacturing industry.

Silk

The year 1930 ended with large stocks of raw silk, but with these stocks declining as American mill consumption rose. Current world production and consumption of silk appear to be in balance, and liquidation of excess supplies to be under way. November wholesale sales of silk goods (yards) decreased no more than usual for the season and were greater than in the same month of the two preceding years. Spindle activity was in a rising trend that began in August (Fig. 6).

In order to allow for new conditions affecting the silk industry, such as the lower price level and the greater use of rayon, the Analyst has constructed a new barometer based on the average for the years 1927-29 (see Fig. 6). Note that each curve has been adjusted so as to eliminate the merely seasonal variations. We find silk spindle activity rising sharply in the second half of tht year and rising above average in November. Note, too, that spindle activity was high in comparison with broad loom activity for the first time since early 1928. Does this closer relation between the two not suggest that silk looms are again operating more largely on silk yarns?

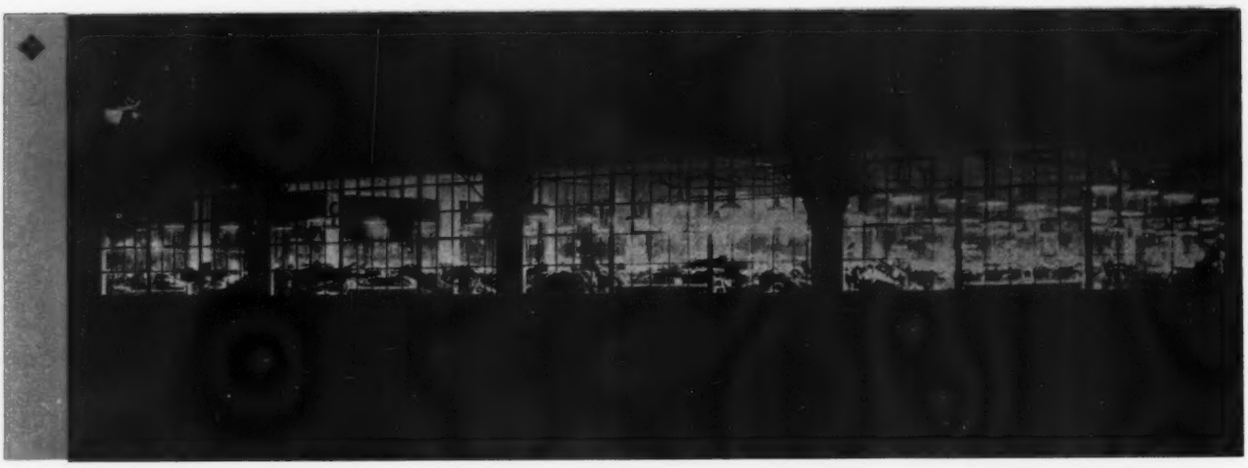
Broad loom activity also increased toward the end of 1930, but less rapidly than spindle activity. While spindle activity was the highest since February, 1928, broad looms were less active than in the early part of 1930.

The estimated "deliveries" as reported by the Silk Association show an extremely sharp increase from June 1930 on, reaching a high record in October. Although declining more than seasonally in November, the last month of the year saw our *adjusted* index at a new high for all time.

It seems reasonable to expect some fairly close relationship between deliveries to mills and the activity of mill machinery. Compared with spindle activity, however, the deliveries were above average during most of the 1928-29 period, though they were maintained at about the same relation with broad loom activity throughout. The deliveries ran up sharply from June through September, 1930, in which month they were extraordinarily out of line with indicated requirements and the ratio was far above average. Did this not indicate speculative buying?

At the end, the delivery ratio declined, indicating that the speculative demand had been largely satisfied, but it remained somewhat above average in December.

At this writing, it seems probable that raw silk prices will maintain an irregular sidewise movement during the first month or two of 1931, then dip rather sharply in late February or March, recover partially, turn dull, and rise in the fall. Probably the silk market touched bottom last October. The average for 1931, however, is likely to be somewhat under that for 1930.



Move to Eliminate Night Work

for Women and Minors

Outstanding 1930 Accomplishment

By Douglas G. Woolf

Editor, TEXTILE WORLD

PROLIFIC in its development of many sound and constructive moves in the textile industry, 1930 will nevertheless be best remembered as the year when the fallacy of night employment of women, and minors under 18 years of age, in cotton mills first became generally and articulately recognized. That 1931 will see this new psychology crystallized into action is indicated by the fact that, at time of writing, 23,289,730 spindles, or 73½% of the total equipment in place in going mills, have been committed to this policy.

Late in the year there also developed a similar proposal for woolen and worsted mills. There is a possibility of definite action in this field in 1931. Although it is of far less importance than in cotton mills, the spectacle of the textile industry presenting a united front on this problem would be an inspiring one—and would add immeasurably to the growing recognition which textile progress is receiving from the outside.

We list this night work move as the outstanding 1930 accomplishment in textiles for two reasons: (1) From both humanitarian and economic standpoints, it is the most constructive and far-reaching single step taken in years; (2) it has done most to win sorely-needed public approval—without which, believe it or not, no industry can permanently prosper.

Not a Single-Purpose Move

Attempts have been made to isolate the motives which actuated the night-work movement; to offset humanitarian aims against economic considerations; to characterize the step as wholly social or wholly business. Such attempts are fruitless.

Behind most human activities there are complicated motives which defy quantitative analysis. This is particularly true in the case of the move to end night work for women and minors. The nearest that it is possible to come to a correct evaluation of its purport is to say that for years the best thought of the industry has inclined to the belief that night working by women and minors is socially inadvisable and indefensible; and that during the last year the economic inadvisability of unbridled night operation became sufficiently apparent to supply just the needed impetus for an industry-wide campaign against it.

This amounts to an admission that economic considerations have more weight in business than have social considerations. Not being prepared to support the negative, we are willing to let the admission stand.

Whatever the motives may have been, this fact stands

out: A step which has been discussed for years and which twelve months ago seemed impossible of achievement, today has practically reached the stage of accomplishment.

Apportionment of credit for the victory is difficult. We have already paid proper tribute to Old Man Depression. Individuals in the industry share in the laurels. Specific reference should be made to the vision of the late Arthur T. Bradlee who in 1925 wrote a most convincing and far-seeing article which was published, posthumously, in TEXTILE WORLD in 1928. Many other leaders have courted unpopularity in past years by expressing themselves forcibly on the subject. Mention may be made of William D. Anderson, H. R. Fitzgerald, Eben E. Whitman, B. B. Gossett, Henry P. Kendall, Thomas M. Marchant, but the roster is far from complete.

Then, too, there has been the weight of a new mental attitude in the industry at large; a disposition to look beyond the gate of the individual mill and to orientate one's own job to the job of the industry as a whole.

Finally, there has been the inspiring help of The Cotton-Textile Institute which furnished a medium through which this new attitude might become vocal.

All this, roughly, constitutes the reason why the recommendation of The Cotton-Textile Institute that cotton mills eliminate the night employment of women and minors not later than March 1, 1931, received almost instantaneous support.

Some of the results of this action are obvious; others are problematical and to some extent controversial.

From the humanitarian standpoint, the move places the United States in the ranks of practically all the civilized countries of the world which have decreed against night employment of women and minors.

It does not, it is true, meet the objections of those sincere feminists who contend that the industry has no right to restrict the inherent freedom of a woman to decide, equally with a man, whether or not she shall work. Much as we respect and sympathize with those who resent sex discrimination, we cannot recall a single social, political or economic advance which has been made without inhibiting the freedom of one or more groups or classes.

In a perfect state, which of course we may some day achieve, none of the prohibitions with which we are continually surrounding ourselves would be necessary; they would in fact be insulting. In the present stage of human development, we are forced to base our actions upon the best interests of the average individual and of the race as a whole.

It is the belief of the majority that night employment of women does not promote the best interests of either the average individual or the race as a whole. It is equally the conviction of the majority that economic pressure does not permit the average woman in a mill family to exercise a free and intelligent choice as to whether, and when, she shall work. Consequently, it is deemed advisable to exercise that choice for her—once more imposing restrictions based on the best interests of the average individual and the race as a whole.

It has been further argued that the industry would manifest its sincerity more effectively if it decreed the abolition of all night work, for both men and women. Believing, as we do, that there is no particular reason why all the cotton goods needed in this country cannot be produced in the day time, we still know of no way, other than by Federal legislation, in which an agreement to that end could be enforced. On the other hand, we are morally convinced that the force of public opinion will not permit "back-sliding" when the question of night work for women and minors is involved.

Economic Effects

Economically, the cotton industry's night work move substitutes, to a large extent, full-time day employment for part-time day and part-time night work. Naturally, it involves considerable labor adjustment; and, to a certain degree, hardship to individuals during that period. Far more of this adjustment has been accomplished than is generally realized. Long-visioned manufacturers have seen the hand-writing on the wall, and have taken preparatory steps in past months. Ultimately, those wage-earners who remain in the industry will have a far more assured future than would have been possible under the old regime.

The extent to which this action will reduce night work in general, is one of the problematical (and controversial) points. It must be emphasized that the Institute's recommendation involves women and minors only. It does not meet the specifications set down by the Textile Converters Association in December.

There has been, and will continue to be, endless debate as to the extent to which cotton mills can operate efficiently at night by employing only males over 18 years of age. Conclusive testimony on either side of the argument is lacking at present.

There is no doubt that many mills will continue night operations, with men. This will be particularly true in cases where the equipment in different departments is out of balance, and where there is a choice between adding additional machinery of a certain type to increase the day output of the department concerned, or operating existing equipment day and night. This will also be true in cases where mills are producing goods for a specialized market, and where there is sufficient current demand for day and night output of machinery in place.

There is also difference of opinion as to the impetus which the move will give to plant expansion. To say that there will be no new construction as a result of the night work action, would be indulging in foolish and poorly supported prophecy. However, any belief that the industry may now launch into an era of building is not justified by the facts. If there were demand in sight, either now or for the next five or ten years, for the product of full-time day-and-night operation of existing machinery, immediate expansion would be warranted as preparation for filling that demand. The best opinion, however, indicates that even optimum market conditions over the course of the next several years, will not permit the absorption of much more than the full-time day production of the industry's machinery now in place.

By proper planning, manufacturers can spread their production approximately uniformly over the 52 weeks of the year, and can meet the demand with comparatively little over-time operation. When abnormal demand, which could not be foreseen, develops, there will be no legal nor moral restrictions against meeting that temporary demand with a night shift composed of men.

In other words, the industry will have placed itself in a position where the night shift will be just what it was originally intended for, that is, an emergency measure; rather than what it has degenerated into since the war, namely, an apparently normal method of operation for the product of which there is no correspondingly normal demand.

New Attitude in Cotton Industry Inspires Confidence for 1931

By
George A. Sloan
President
The Cotton-Textile Institute, Inc.

SIGNIFICANT achievement by means of cooperative efforts was recorded during 1930 by the cotton manufacturing industry. Outstanding among the developments is the better public attitude toward this great industry and its products, evidenced by the unusual attention given to cotton goods by retail stores in their advertising, and by the radio, cinema and the press. The recognition thus accorded to cotton is felt to be largely in response to the industry's group action in undertaking to impress upon the public, by means of vigorous educational measures and by direct contact with consuming interests, the appropriateness of cotton for unlimited purposes in wearing apparel, in industry and in the home.

Constructive cooperation made important progress in other directions as well as in sales promotion. Broader phases of textile problems came to be realized to a greater degree than ever before, with the result that industry-wide attempts to solve them are steadily replacing the isolation and extreme individualism of the past. An individual member of industry, no matter how ably he conducts his own business, cannot expect to make a consistent success of it if the aggregate effect of the industry's practices is unsound. This economic truth is now understood more clearly and accepted more generally than perhaps ever before in the history of our industry.

In effect, two of the most forward looking steps that were undertaken during 1930 were largely, if not entirely, possible because of the more general recognition of cooperation as a sound intelligent business principle. Early in the year this attitude made itself felt in the efforts to bring about greater uniformity in running time for labor and machinery through the 55-50 recommendation.

Unquestionably the greatest test of the industry's new attitude, and consequently one of its major undertakings in many years, came with the recommendation for discontinuance of night employment of women and minors. This is a subject of such vital, economic and social importance that it calls for a thorough revision of many practices and principles that have grown up in the industry.

One of the encouraging results of widespread diffusion and study of economic reports relating to trade conditions, made possible through the industry's cooperation in compiling statistics, was avoidance of overproduction. Available reports on Dec. 1 indicate that for the first 11 months of the year more cotton goods were sold and shipped than were produced, and that the heavy stock on hand at the beginning of the year was substantially reduced.

Further evidence of the industry's new attitude of cooperation is to be found in steps taken to build up export markets through the formation of the new Textile Export Association of the U. S., and also in the approach to important phases of arbitration through the formation of the General Arbitration Council of the Textile Industry.

Moreover, the increased cost work of the Institute reflects the conviction on the part of many mills that there should be a clearer understanding of true costs, and there has arisen a most gratifying willingness among mills to work with our field representatives in devoting further study to this important subject.

Looking back over recent experiences, it is quite clear that the important accomplishments during 1930 have been due to the more general recognition of the inter-dependence of industrial units. The progress made to date along all the foregoing lines, in spite of great difficulties, should inspire confidence in the outlook for the year to come.

Wool Weaving Industry Discarding Its Traditions

By
A. D. Whiteside
Former President
The Wool Institute, Inc.

THE woolen and worsted weaving industry has passed through five very difficult years.

But these years have been far from wasted.

These five years have been spent in discarding the traditions that had prevailed for two or three generations and in liquidating obsolete fixed assets that could not compete successfully against modern equipment.

This process is today well on its way to completion and this industry which consisted of 365 mills equipped with 65,510 looms at the close of 1927 now numbers 297 mills with approximately 42,000 looms.

Within three of these past five years, the industry has liquidated 35% of its productive machinery and no mill of major importance has become insolvent.

On the contrary, in the face of a continually declining raw material market, causing inventory losses which could not be offset, particularly by the larger units, by manufacturing profits; surrounded by the keenest competition from other fabrics sold to the same markets, as far as women's wear is concerned; this industry, through its fundamental soundness and the stamina of those managing its operation, has worked itself into a peculiarly strong liquid condition, a position from which it may take immediate advantage of the slightest trend for the better in general conditions to work into a decidedly favorable position from the standpoint of profits.

During these years the mills of this country have improved the quality and the style of the fabrics manufactured to a degree that did not seem possible a few days ago, and these goods that now equal or surpass any similar merchandise manufactured in any country are reaching the manufacturers of apparel at prices relatively lower, from a conversion cost standpoint, than those materials of considerably lower quality which were woven previous to 1925.

The majority of mills will make money because their inventories are directly controlled by current sales; because their management is alive to the fact that the most efficient machinery and equipment must be installed in this highly competitive market; and because their management is analyzing and simplifying its methods of operation and is introspective and self critical.

Cooperative effort in this industry up to the present time does not superficially appear to have proved successful.

But these efforts, in which a few of the outstanding men of this industry have sincerely and honestly participated, will have had a deep and lasting effect, for it may be as a result of these organization meetings that an important number of men of this industry have either changed or modified their viewpoints toward the production or marketing of woolen and worsted piece goods.

It is ridiculous to assume that woolen and worsted weavers are unlike other men.

It is true that they have an unusually acute sales problem, but the men in this industry are now fully capable of coordinating and working out these basic problems.

The present directorate of the Wool Institute and the personnel of its administrative organization have developed a sane and workable program, which will in the near future be accepted by the industry as a whole as the mechanism through which to work out the constantly varying problems which must be solved by this and every other industry if profitable operations are to be consistently maintained.

Many Textile Mergers Effected

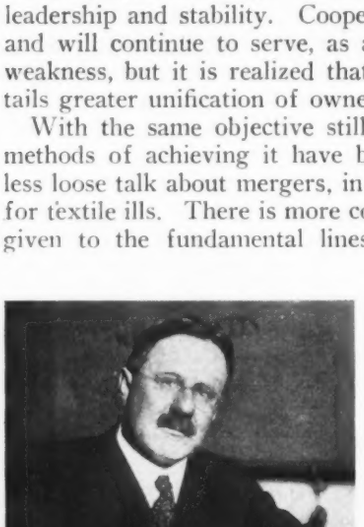
Many More Rumored In 1930

A Survey of Recent Trends Toward Consolidation in the Textile Industry, Compiled from TEXTILE WORLD Records

IF ALL the rumors of textile mergers current in 1930 had materialized, the industry would now be as centralized as is the steel industry. However, many were visions of the imagination; others were founded on fact but failed to reach the stage of accomplishment. Nevertheless the number of combinations actually effected, although small in proportion to those reported, was sufficiently large to represent a major trend. Others, now in the formative stage, are sufficiently promising to foreshadow further developments in 1931.

Sharing interest with this factual material, is the progress made in industry thinking on the subject of mergers. Fundamentally, of course, the same objective obtains as in the past: correction of the condition of extreme decentralization which deprives the industry of leadership and stability. Cooperative action has served, and will continue to serve, as a vital corrective of this weakness, but it is realized that maximum progress entails greater unification of ownership.

With the same objective still in view, opinions as to methods of achieving it have been modified. There is less loose talk about mergers, in themselves, as a cure-all for textile ills. There is more constructive thought being given to the fundamental lines which mergers should follow. A lesson has been learned from other industries where combinations, meeting specifications as to size, capitalization, and impressiveness, have fallen of their own weight.



Homer Loring, principal executive behind the largest of the cotton mill mergers.

Briefly, it is felt that a merged company should embrace only strong units; that weak units, if acquired, should either be liquidated and the machinery scrapped, thus removing uneconomic competition from the field, or rehabilitated immediately and transformed into successful plants; and that the type of executive personnel of the resulting combinations is probably the primary consideration.

As to the initiative for promoting such mergers, bankers have warned the editors of TEXTILE WORLD that the impetus should come from *within* the industry; that outside financing should not be sought at the start; and that solicitation of public interest in a merger should follow, not precede, the demonstration of its soundness.

So much for theory. The facts regarding textile mergers projected or consummated last year are summarized below.

Fine Cotton Goods in Spotlight

The merger spotlight in 1930 centered primarily upon the fine cotton goods industry of New England. Here it is difficult to separate rumor from fact. Formation of a holding company designed to control 4,000,000 spindles in this branch was reported in process in September; rumors were that 2,500,000 spindles had signed up. All that is definitely known at present is that the General Cotton Corp. was incorporated under the laws of Delaware with authorized capital of 800,000 shares of common, no par, of which 300,000 were to be subscribed for at an aggregate price of $600,000, the balance to be held

for possible issuance for cash or in connection with the purchase of mill properties; and that this corporation has actually acquired the Lincoln Mfg. Co. and the Davis Mills, both of Fall River. The alleged purpose is to acquire mills, scrap inefficient machinery, and salvage such properties as can be operated successfully. It is further understood that, under present plans, the General Cotton Corp. will function as a holding company. Current report links both the Berkshire Fine Spinning Associates and the United Merchants & Manufacturers, Inc., with this development. No official statement of such association of interests has been made. However, Homer Loring is a director of General Cotton Corp.

Samuel Insull, whose utility properties are acquiring textile mills

Both the latter groups have further consolidated their positions. The Berkshire Fine Spinning Associates during the year acquired the King Philip Mills and the Parker Mills, both of Fall River. United Merchants & Manufacturers, Inc., controlling six cotton spinning and weaving plants and four finishing plants, and combining the merchant converter function in the organization, reported in December that plans for the company were working out exactly along the lines laid out a year ago and that remarkably good progress had been made considering business conditions.

The Jerome A. Newman interests, reported as backed by Bancamerica-Blair Corp., which had already acquired the Merchants Mfg. Co., Fall River, added to their holdings in 1930 the Flint Mills of Fall River and the Bristol Mfg. Corp. of New Bedford. Rumors were current during the year regarding further merger activities of Mr. Newman and various mills were mentioned as involved, but to date nothing definite has been officially announced regarding the results of these negotiations other than as mentioned above. Latest gossip hints of an understanding between Mr. Newman and the recently formed General Cotton Corp.

Russell H. Leonard, whose progressive company is gradually enlarging its scope

Although, as stated, the fine cotton goods industry was particularly prominent in merger rumors and events, practically all branches were featured by actual or reported combinations of varying size.

One of the most interesting rumors involved combed yarn mills in Gaston County. Due to various contributing circumstances, this failed to materialize but there is reason to believe that the proposition will be revived this year.

Among the actual merger developments in 1930 in the textile industry appear the groupings listed in the adjoining panel in alphabetical order.

Textile Machinery Merger

The merger impulse also spread to the textile machinery field. An outstanding example was the acquisition by the Whitin Machine Works of the Fales & Jenks Machine Co. and the Woonsocket Machine & Press Co.

AMONG 1930 MERGERS

American Combed Yarn Corp., Gastonia, N. C., formed as combination of **Clara Mfg. Co., Dunn Mfg. Co.** and **Armstrong Cotton Mills Co.**

Eagle Knitting Mills, Milwaukee, Wis., knitted outerwear, acquired **Stern Knitting Mills,** of Peoria, Ill., bathing suits and juvenile knitted clothing.

Falls Mfg. Co. and **Southern Mfg. Co.**, cotton yarn plants of Granite Falls, N. C., combined.

Knit Goods Corp. of America formed to take over **Alabama Hosiery Mills,** Decatur, Ala., and to build other full-fashioned plants in South; constructed **Corinth (Miss.) Hosiery Mills.**

Lincoln Hosiery Corp., Philadelphia, seamless and full-fashioned hosiery, acquired **Brentmore Knitting Mills,** full-fashioned hosiery, Philadelphia.

Lincoln Knitting Co. and **Merrill Knitting Co.**, both of Merrill, Wis., merged under name of former; product is knitted outer and underwear.

Logan Knitting Mills, Inc., and **Cache Knitting Works, Inc.**, both of Logan, Utah, merged.

Murch Worsted Mills, Inc., Methuen, Mass., new name of **International Worsted Mills** with which **Selden Worsted Mills** had merged.

New England Industries, Inc., controlled by New England Public Service Co., an Insull property, acquired **York Mfg. Co.**, Saco, Me. This corporation had previously secured control of **Androscoggin Mills, Bates Mfg. Co.**, and **Hill Mfg. Co.**, all of Lewiston, Me., and **Edwards Mfg. Co.**, of Augusta, Me.

Nu-Craft Hosiery Mills, Inc., Mohnton, Pa., perfected plans for chain of six mills in Pennsylvania; acquired **Chas. Steiner** plant at Reading for silk throwing and hosiery dyeing and finishing, **Wagner Hosiery Mill** at Curwensville, and **West Chester Hosiery Mills** at West Chester.

Pepperell Mfg. Co. acquired shoe fabrics and specialty divisions of **National Fabric & Finishing Co.**

Propper-McCallum Hosiery Co., Inc., New York, formed by merger of **McCallum Hosiery Co.** and **Propper Silk Hosiery Mills, Inc.**; plants in Philadelphia and Holyoke, and Northampton, Mass.; men's, women's and children's hosiery.

Ranlo Mfg. Co., Gastonia, N. C., acquired **Harden Mfg. Co.**, Worth, N. C., carded yarns.

Raritan Mills, Inc., Raritan, N. J., chartered to take over and operate **Raritan Woolen Mills** and **Somerset Mfg. Co.**

Shuford Hosiery Mills, Hickory, N. C., formed from merger of **Long View Hosiery Mills,** of Hickory, and **Conover (N. C.) Knitting Co.**

Southern Bleachery & Print Works, Inc., formed as a result of merger of **Southern Bleachery, Inc.**, and **Piedmont Print Works,** both of Taylors, S. C., and **Rockland Finishing Co.**, of Garnerville, N. Y.

Standard-Coosa-Thatcher Co. acquired **Sauquoit Spinning Mills,** Gadsden, Ala.

Trojan Hosiery Mills and **National Silk Hosiery Mills,** both full-fashioned hosiery plants of Indianapolis, Inc., merged and carry on business under former names, the National operating as subsidiary.

Tubize Chatillon Corp. formed by merger of **Tubize Artificial Silk Co.** and **American Chatillon Corp.** New company, with plants at Hopewell, Va., and Rome, Ga., manufactures under three processes: viscose, acetate and nitro-cellulose.

United States Silk Hosiery Mills, Inc., Philadelphia, acquires **Logan Hosiery Co.**, also of Philadelphia, thereby increasing its number of full-fashioned hosiery plants to four.

New Era of Textile Distribution *In the Making*

By O. Fred Rost

Director, Survey of Distribution, McGraw-Hill Publishing Co.

NECESSITY, aside from being the mother of invention, is proving itself also the mother of revolution insofar as distribution practices in the textile industry are concerned.

Heavy over-production capacity, large stocks with accompanying heavy overheads, resultant pressure in a declining market and greatly reduced consumption, prompted many manufacturers for the first time to look beyond the doors of their own shipping department to the point where their goods were finally used, and to consider the route by which those goods travelled to their destination.

Many producers found that their goods lost all identity before ever reaching the ultimate consumer. They found some traditional trade practices extremely cumbersome, round-about. They realized for the first time that their particular branch of the industry was perhaps contributing more than its share to the annual 4 to 6 billion dollar waste in distribution practices.

Merchandising-Mindedness

Some of those manufacturers have achieved a considerable state of merchandising-mindedness within a remarkably short space of time. They have created brands, developed packages, made sure that the final consumers could always identify their products. They have backed their new merchandising set-up with suitable advertising, and thus have built up rather remarkable performance records.

Other manufacturers have particularly addressed themselves to building up more direct contacts with their final consumers and are no longer willing to take someone's else word regarding matters vitally important to their welfare.

Hence, out of the period of great distress through which industry has been passing, many manufacturers are emerging with a well established market for their own brand of merchandise, and, what is even more important, with a more complete understanding of where their goods find a market, by whom and why the goods are bought, and how a specialized demand for those goods can be created.

There are and have been many manufacturers of swimming suits, but it took the Jantzen Knitting Mills to show that the public could be made to buy a specific brand of a rather seasonal commodity, and pay a higher price for the branded article.

Jantzen built its distribution through wholesaler and dealer channels. This firm's performance has been one of steady growth; even in 1930 its sales went over 10% ahead of the previous record year 1929. It just recently paid a 100% stock dividend, increased its rate of cash dividend, and with it all reports business coming in in 1931 at a steadily increasing rate.

Many Textile Examples

The Cannon Mills stopped merely selling towels, sheets, pillow cases, etc. to wholesalers, but in a carefully planned advertising campaign told the American housewife all about Cannon products. Within the space of a few years they have built up such complete public acceptance and good will toward the Cannon brand that the retailers, so inclined, find it difficult to substitute.

When color became a factor in their line of products Cannon Mills promptly cashed in on the demand by providing what the public wanted. They take advantage of every new development of merchandising practices, bring

out attractive packages. Because of their aggressive merchandising methods they find themselves safely entrenched.

The Consolidated Textile Corp., with its "Fruit-of-the Loom" brand, has created a definite standard of quality in the minds of the public. Thousands of housewives refuse to buy any other sheets and pillow cases.

The Pepperell Mfg. Co. since 1924 has concerned itself more and more with the ultimate users of its various products. In 1926 it decided to create its own sales organization. Consumer goods today are carefully and attractively packaged to create greatest possible eye appeal. Goods made for the cutting-up trade are branded and a definite part of the advertising appropriation is spent in creating a demand for shirts, children's garments, etc., made from Pepperell-branded materials.

Cheney Bros. no longer let any one in the plant decide patterns and colors. Fashion trends of fabric, style and color are carefully studied in many places.

Markets for their products are studied from the standpoint of importance and volume. Retailers are given valuable cooperation, including fashion shows conducted by the manufacturer.

Thus specific examples prove conclusively that contrary to traditional opinions textile products are susceptible to basically the same type of marketing and merchandising treatment as are automobiles, shoes, electric washing machine, or Campbell's soup.

Merchandisers at Helm

That leaders in the textile industry recognize this fact was just recently emphatically demonstrated by the change in executive management of the American Woolen Co. The ability of that company to produce satisfactory merchandise has never been questioned, nor was there any doubt that it could manufacture all the goods that it could sell, but its records over a period of years demonstrated that it could not sell all the goods it could make.

Merchandising-mindedness is going to be at the helm of this company in the person of the newly-elected chairman of the executive committee, William B. Warner, and the new president, Lionel J. Noah. Both have behind them a record of achievement that leaves little doubt as to their ability to provide in the future performance of the American Woolen Co. another example of what is needed by the textile industry as a whole.

Incidentally this change in type of executive management taking place in the American Woolen Co., has its precedent in other industries. For instance up to 1922 the destiny of the great General Electric Co. was controlled by men who were trained as engineers and who consequently decided the marketing problems from the engineer's standpoint. Gerard Swope, outstandingly successful as a merchandiser and sales executive in the same industry, was made president. To a considerable extent it has been his merchandising-mindedness and ability to develop markets which have enabled that company to maintain and fortify its position of leadership during a period of rapid expansion and unprecedented competition in that industry.

While unquestionably textile manufacturers must continue to improve their merchandising ability and must build up more intimate direct contacts with their markets, they must also realize that traditional methods of distribution cannot survive the period of waste elimination through which all industry is passing.

When the Pepperell Mfg. Co. created its own sales force back in 1926, it practically signed a declaration of independence in that it immediately established direct contact with its market and placed itself in a position to eliminate wherever possible wasteful practices. Other manufacturers have followed the Pepperell example; many more must follow.

The clothing industry has practically no intermediary functioning between manufacturer and retailer. Shoe manufacturers found it necessary to eliminate the wholesaler and 90% of shoes are either retailed by the manufacturer direct or sold by him direct to the retailer.

Many manufacturers of hardware, plumbing, electrical goods, have found it necessary to address all their sales effort direct to the retailer because they found wholesale distributors unable to create and maintain a satisfactory market for their products.

Out Go Wasteful Practices

This process of elimination of wasteful practices is continuing in practically every line of industry. The 1930 record of failures throws some interesting light on the elimination of waste that is going on in the distributing branches of all industries. Failures of agents, commission men, commodity brokers, have been rising steadily since 1925. Liabilities, less than 50 million in 1926, rose to 156 million in 1930. While this type of failures accounted for less than 10% of the total 1926 liabilities for all industries and the whole country, it represents over 22% of the 1930 total.

On the other hand, the failures of manufacturers of woolens, cotton goods, knit goods, carpets, lace, hosiery, which in 1926 involved 69 concerns and liabilities of over $8,300,000, were in 1930 reduced to but 56 with liabilities of $6,600,000, or less than 1% of the 1930 total of all liabilities.

Retailers in all lines of merchandise, which formed 49% of all 1926 liabilities of bankrupts, were responsible for but 41% of the 1930 total.

Many efforts at elimination of waste in distribution were crystallized into action during recent years and particularly stimulated during 1930. Obviously these found their best opportunity at those points in the distribution system where economic justification for a traditional habit could not be established.

Export Cooperation

for Expansion of Foreign Trade

By William B. Dall
Managing Editor, TEXTILE WORLD

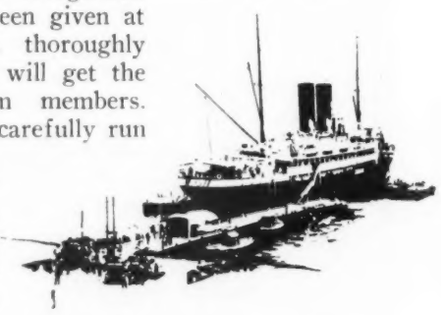
TWO textile groups, the American Textile Trading Co. (mercerized yarns), and the Textile Export Association of the U. S. (cotton goods), have been incorporated under the Webb-Pomerene law for cooperative effort in the export field. The fact that these two bodies have not yet made much of a stir does not mean lack of progress, for, according to those who are familiar with the technique of these export associations, a good start is properly a gradual one. Fullest cooperation is permitted by law, but the association, like a child growing up, must learn to function gradually and by a series of natural stages. The textile groups are in their infancy.

At the start it is essential that new export groups find matters on which there is most general agreement and push their first activities along these lines. Such are chiefly matters of coordination; for example, exchange of credit information, uniformity of marine insurance, organized representation at freight conferences, good will propaganda, etc. Students of Webb-Pomerene units state that these bodies should set no limit upon their ambition, but should insist on moving slowly. Successful work in this field is possible only through cooperation and cooperation among competitors is something which must be learned. Leading directors of these bodies believe that their work must be unanimous and carried out without penalty; it can go only so far as 100% of the members permit. Although penalties are used in some associations to keep their members in line, those who are penalized are likely to lose the spirit of frank discussion and sow discord. The unpenalized violator may be brought back into the fold.

There are as many methods of arriving at cooperative action upon policies, terms, prices, etc., as there are associations. There are failures as well as successes, and enough object lessons are available to cast much light on the proper course for the textile associations and their probable achievements.

Fear of consequences and open hostility are often encountered early in the growth of a Webb-Pomerene association. Hostility may naturally come from concerns whose existence is threatened. The association is primarily aimed to effect economies in export. Duplication of effort must go. Too many commissions between the producer and the foreign customer must give way to short cuts. Agents and trading companies must fit themselves into the new picture where they can. If 20 companies have 20 agents in the same territory, in the cause of efficiency many must go, but for those left there is better business to be had and greater reward to stimulate more effective effort.

A stabilized export price is possible under Webb-Pomerene law. This stabilization ultimately works to the benefit of the foreign customer, and many bodies now in the field have found uniform price schedules thoroughly practicable and workable. It goes without saying that no price basis can survive which is not based on fair value, for an exorbitant level quickly brings its own trouble through economic (not Federal) laws. Too high an export price has been known to choke the domestic market with stocks and result in a sharper ultimate break than had saner recognition of economic laws been given at the beginning. A thoroughly fair price schedule will get the best support from members. Associations which carefully run down all rumors of price breaking in the foreign field by members, report that they find the cases 99% untrue, the rumors in fact coming from buyers as a part of their buying tactics.



Some Webb-Pomerene associations allocate export business among their members, not only as to share in total volume but also as to share in certain territories. Some of the associations have effected cooperation with cartels of similar manufacturers in other countries, achieving a world-wide understanding on matters of price and share of business in certain territories. Such extensions are possible, and useful in certain fields, but not essential. Some associations actually carry on business for their members, taking orders, shipping, and billing. Others act merely as a clearing house, receiving reports on sales and prices, and working to coordinate their members' activities in the foreign field. Advertising and publicity in the foreign field to counteract impressions roused by ignorance or jealousy, is a logical function.

So far the textile Webb-Pomerene effort has concerned itself chiefly with credits and good will. South and Central America is the market principally in view. The nations in this territory are chiefly "one crop" countries, and a year of crop failure or overproduction brings a real set-back. This has been the 1930 experience in several of the important centers. The present seems to be a time to build up good will and better understanding, rather than actual business.

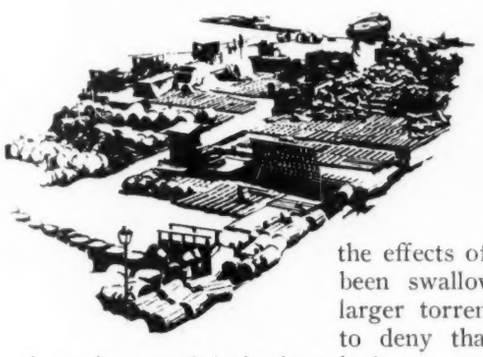
The Textile Export Association has hopes of real expansion in South America, believing that in goods where cotton is the preponderating factor in price, the United States has an advantage of Europe. In this territory price rather than brands, gets the business. If the belief of some economists is correct that labor costs the world over are gradually tending toward equalization, then the opportunity for American textile manufacturers to supply the needs of Latin-America in competition with Europe are likewise broadening.

Tariff Effects

Obscured by World Conditions

From Washington, D. C., Office,
TEXTILE WORLD

BECAUSE the proportions of world-wide depression in trade are so much greater, it is practically impossible at this early date to measure the effects of the new tariff on textile imports. Imports of textile manufactures during the first 11 months of 1930 were 36% smaller in dollar volume than in the corresponding period of 1929, but almost half of the decrease occurred prior to June 18, the effective date of the new act.



That textile export trade suffered practically the same relative decline as import trade last year also is evidence that the effects of the tariff have been swallowed up by the larger torrent. This is not to deny that on numerous items increased duties have had a very certain effect, but, except in a comparatively few instances, they cannot be measured statistically because of changes in class.

Imports of long staple cotton, for example, have dropped almost to nothing since the duty of 7c. a lb. was laid on all cotton having a staple length of 1⅛ in., but a large supply was imported prior to application of the duty. Comparable statistics are available only for cotton with a staple length over 1⅜ in. Imports from Jan. 1 to June 17 inclusive, totaled 38,425,714 lb. Imports from the latter date to the end of October amounted to 125,440 lb. Imports for the year 1929 totaled 49,177,753 lb. Measured in terms of tire production, imports during the first 10 months of 1930 averaged 1.06 lb. per tire as compared with 0.94 lb. per tire in 1929.

While the effect of the 7c. duty on the imports of staple cotton is obvious, it is impossible to determine to what extent the compensatory duty of 10c. on fabrics containing such cotton is accountable for the decline in imports of cotton cloth. There are isolated cases where the duty on unbleached cotton cloth has doubled because of the new minimum duty of 55/100 of 1c. per average number of lb.

Imports of wool rags have practically ceased since the increase in duty from 7½c. to 18c. a lb. but it is too soon to determine whether this cessation will be permanent. Imports amounted to 21,639,000 lb. in 1928; 19,864,620 lb. in 1929; 6,887,921 lb. from Jan. 1 to June 17, 1930; and 154,750 lb. from June 18 to Nov. 30. These figures include imports for consumption and warehouse entries. Manufacturers stocked up prior to the tariff. Effects of the other wool schedules are obscured.

An increase in imports of wool knit wear since the new tariff became operative appears to be confined to knit underwear valued over $1 a pound, and over $2 a pound, as the increase in duties in these two brackets was very slight, the ad valorem equivalent on the $1 bracket averaging 72.28% under the new act as compared to 69.80% under the 1922 tariff; and on the $2 bracket, 59.99% under the new act as compared to 58.99% under the 1922 act.

Rayon yarn imports, particularly 150 denier and coarser, were sharply curtailed, the total for all singles amounting to only 5,062,160 lb. to the end of October, 1930, as against 15,408,215 lb. in 1929. Although the rate of duty on yarns of 150 denier and coarser was not raised, the specific minimum duty of 45c. per lb. weighs heavily on declining prices and imports in this classification dropped from 11,917,074 lb. in 1929 to 2,493,222 lb. in the first ten months of 1930.

Imports of yarns finer than 150 denier during the 10-month period indicate that the total for 1930 will be larger than in the preceding year. Due to the decline in prices the increase in ad valorem rates from 45% to 50% has not been effective and the specific minimum of 45c. per lb. applies. Imports of yarn from 100 to 150 denier amounted to 1,532,137 lb. in the first 10 months of 1930 as compared with 1,587,660 lb. in the entire year of 1929. Imports of 75 to 100 denier have registered an even greater proportionate increase, receipts through October, 1930, amounting to 618,117 lb., as compared with the 12-month total of 578,838 lb. in 1929.

Imports of towels, napkins and bedclothing increased in 1930, the 11-month total numbering 25,532,207, valued at $3,333,957, as compared with imports in the corresponding period of 1929 of 18,721,334, valued at $2,987,658.

IMPORTS OF TEXTILE MANUFACTURES

Jan. 1 to June 17, incl., 1930*
Jan. 1 to June 30, incl., 1929

	1930	1929
Cotton		
Semi-manufactures	$1,990,564	$3,308,246
Manufactures	23,810,494	32,084,554
Wool		
Semi-manufactures	4,583,285	8,940,011
Manufactures	19,007,402	31,552,579
Silk		
Manufactures	11,593,969	18,789,247
Rayon and other synthetic	5,960,666	10,424,089
Jute manufactures	35,372,829	49,579,704
Flax, hemp and ramie mfrs.	19,131,962	22,308,179
Other veg. fibre manufactures	637,022	1,346,175
Miscellaneous textile products	11,836,401	13,418,198
	$133,924,594	$191,750,982

*New tariff went into effect June 18, 1930.

IMPORTS OF TEXTILE MANUFACTURES

June 18 to Nov. 30, 1930
July 1 to Nov. 30, 1929

	1930	1929
Cotton		
Semi-manufactures	$916,191	$2,160,637
Manufactures	16,566,939	26,900,274
Wool		
Semi-manufactures	1,570,527	3,994,709
Manufactures	13,131,764	29,727,210
Silk		
Manufactures	6,039,232	17,742,274
Rayon and other synthetic	1,846,974	6,982,591
Jute manufactures	22,236,628	29,662,475
Flax, hemp and ramie mfrs.	12,117,843	18,926,934
Other veg. fibre manufactures	3,375,217	5,567,481
Miscellaneous textile products	6,749,581	9,934,633
	$84,550,896	$151,599,218

Cotton Mills Become Cost-Minded

By Sydney P. Munroe

Manager of Cost Section, The Cotton-Textile Institute

When we planned this year's "Annual", one of the subjects we naturally wanted to spotlight was the question of costs —not the detailed technique of cost finding but the broad principle of its relationship to manufacturing success. We believe the accompanying analysis of this principle, by Mr. Munroe, represents one of the soundest and most logical statements ever prepared. . . . Although dealing specifically with cotton mills, this article applies equally forcibly to all branches of the industry.—*Editor.*

ANY review of the constructive progress which the cotton textile industry has made toward solving many of its major problems during the last year would be incomplete if it failed to emphasize the rapidly growing appreciation and use of properly developed cost figures. The industry is evidently becoming deeply impressed with the vital importance to any mill which manufactures a diversity of product of having before it full predetermined normal costs on each of its products, if its management is to approach merchandising problems with adequate information.

Substantial evidence supports the belief that cotton mill managements generally are more active in regard to improving their cost methods. Early in 1930 various estimates were noted as to the percentage of cotton mills in the country employing methods of cost procedure which differentiated between the costs of various yarns or fabrics and which were developed along fundamentally sound principles. We believe the most optimistic of such estimates named 40% as representative of the prevalence of such methods in the industry.

It would be unfair to assume that this percentage constitutes any reflection on the industry or its executives. On the contrary there is good reason to believe that in this respect the cotton textile industry compares favorably with many others, particularly if it is borne in mind that it includes a large number of small plants.

There is reason to believe that during the last year mills representing nearly 10% of the industry's equipment have undertaken radical improvement of their cost methods. Thus it seems apparent that the adoption of such methods was at a more rapid rate during 1930 than during any previous year.

Cost consultants report much recent activity along such lines in spite of the relative scarcity of profits and funds which have tended to deter mills from incurring optional expenditures. In the Institute's offices we are receiving more and more inquiries regarding appropriate methods of cost finding, regarding the relative merits of various consultants' services, regarding certain technical details of cost determination, and we are repeatedly confronted with requests from individual mills that we assign our own field agents to the installation of cost systems for members of the Institute.

A Common Fallacy

It seems axiomatic that no mill which proposes to sell a diversified product can hope in the long run to succeed —especially in competition with mills better informed— if it has to determine its selling policies without dependable information as to the costs of its various lines of product. It should be remembered, moreover, that such relative costs are not to be obtained by determining an average cost and then applying arbitrarily assumed differentials. Satisfactory cost figures are not so easily obtained as such attempts would imply. Nevertheless, it has been a stock argument, on the part of those who were disposed to treat the subject lightly, that a mill has no say as to prices, but that it must sell at market levels. Such a contention loses sight of the fact that correctly developed cost figures persistently prove that market differentials do not habitually reflect cost differentials. Price differentials are in most cases affected more by the statistical situation as to supply and demand for the various items in the market than by their relative costs.

Furthermore, where price differentials are reasonably constant it has been observed that these correspond rather closely to incorrect cost differences which were developed

by improper and unsound methods years ago under entirely different conditions from those which now exist. The mill which makes any diversity of product may expect to find, on comparing market prices with proper cost figures, that there are important differences between its different lines of product in the amount of profit or loss obtainable per unit of machinery.

Of course some will point out, in view of recent conditions, that business has not been sufficient to afford any choice of product but that if the mill were to run at all it has had to accept any orders procurable. Such an objection is a temporary one, based upon an abnormal condition but even if such were not the case a resolute determination to correct such conditions should influence every management to be as fully informed as possible, and aggressively to attack the situation rather than to remain inert.

Even during such trying periods actual experiences have shown that those mills which pay strict attention to the soundness and application of their costs appear to better advantage, from the investor's point of view, than those which neglect this matter. As a test of the correctness of this assumption an examination was made of the annual statements of a number of mills manufacturing practically identical goods and situated in the same locality. The mills were selected at random except that half of them were known to employ sound cost methods while the other half did not. Although the period covered was one of depression nevertheless 56% of those mills which had and used dependable cost systems showed profits during that time, while only 12% of the mills lacking proper cost systems were able to do so. The contention may arise that this result depended more upon managerial ability than upon the adequacy of the cost methods in use. If this were assumed to be the case, it would still be undeniable that the executives who were sufficiently alert and competent to earn a reasonable profit under such conditions were men who believed in the value of properly developed cost figures.

Why Interest in Costs Has Increased

Conditions during the past year have been such that mill executives have made special effort to discover and examine all the elements which have contributed to success or failure in the industry. It has become apparent that there has been a great excess capacity for production and with this realization the industry has made marked progress in overcoming this obstacle. There is ample basis for faith that the growing appreciation of the necessity to keep production in balance with demand will have a profound effect in promoting sound merchandising in the industry, in promoting the welfare of employees, and in improving customer confidence.

Many executives, however, have realized that even in the event of the return of a so-called "sellers' market," with its accompanying general benefits, the industry will not take full advantage of such a situation if many of its members fail to inform themselves as to their full and true costs. Even though the statistical position might be such as to indicate that reasonable profits should be generally attainable, mills will not derive full benefit from such conditions if many of them are misled into quoting prices which have not taken into account all eventual elements of cost such as full depreciation and interest on investment, the replacement value of raw material, and proper allowance for such normal curtailment as the demand for any particular line of goods may forecast.

Moreover, it is realized that the cost figures derived by different mills on any specific fabric or yarn have differed widely. While some of this variation is undoubtedly well-founded and due to differences in managerial ability, wage rates, operating schedules, etc., nevertheless, to a large extent, they reflect the fact that the costs have been figured properly in some instances and improperly in others, and that some mills have included items in cost which other mills have omitted. The elimination of such unjustifiable differences, together with a knowledge that the great majority of mills are developing costs along similar and sound principles, and are including all proper elements of cost, will greatly improve the confidence of buyers, will strengthen the morale of salesmen, and will make for improved market conditions.

In examining the causes for some of the conditions which have existed during the past year the presence of many comparatively worn out and obsolete mills without sufficient resources to improve their physical condition has impressed upon managements the importance of a proper allowance for depreciation (including obsolescence) in cost calculations and in price quotations. This realization has doubtless been intensified by the exhaustive study of depreciation which has recently been completed. The fact that the great majority of the industry is under-capitalized has been driven home most forcibly

by the difficulty which many mills have experienced in securing sufficient working capital to stand the strain of the unusual curtailment made necessary by the existing market conditions. In the minds of many this demonstrates the importance of including in costs for selling purposes the item of interest on investment, calculated on a replacement basis (regardless of authorized capitalization), and of the inclusion of a proper allowance for such predictable curtailment as the consumption of goods may indicate. The wide fluctuation in cotton prices has again emphasized the importance of calculating cotton costs, for selling purposes, on a replacement basis.

Emphasis of such considerations has been more centralized and co-ordinated of late years through the medium of The Cotton-Textile Institute and as a result of the admirable cooperation extended by other associations of manufacturers, by the trade journals, and by professional cost consultants.

In spite of the many disadvantages under which industries have operated in the past year, and regardless of the appearance of profit and loss statements, the cotton textile industry has made notable progress during this difficult time. It has been building a foundation on which a period of real prosperity may well be based, provided there is no recession of the determination with which the industry is attacking and correcting its ills. The progress already has occasioned nation-wide interest and is being pointed to by the press, by leaders in other industries, and by financial interests. The accelerated adoption of sound cost methods in the industry forms a real part of this progress.

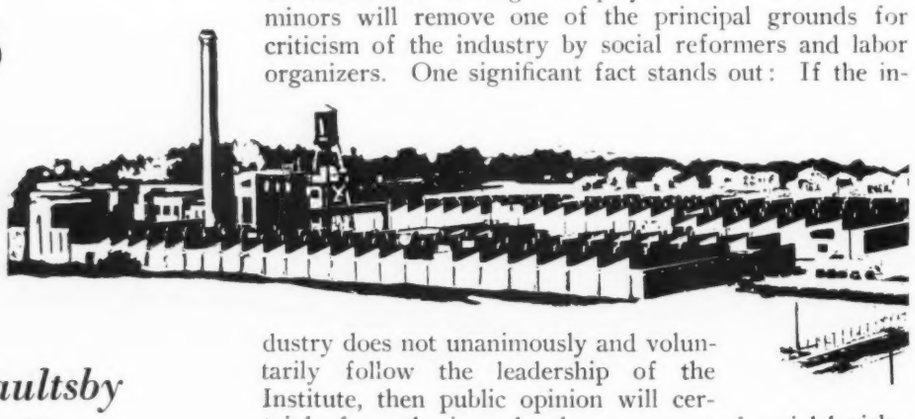
Southern Employer-Employee Relations

By Ralph C. Maultsby
Southern Editor, TEXTILE WORLD

WHAT changes will the picture of southern industrial relations show in 1940? During the last twelve months, straight-thinking mill executives, appreciating the importance of this question, have devoted much time to a careful analysis of their labor policies. Motivated as a result of this process of self-examination were certain constructive influences that are placing employer-employee relations in the South upon a more substantial basis.

Most significant and far-reaching of these constructive factors is the present movement, initiated by mill executives through the agency of The Cotton-Textile Institute, which proposes the voluntary elimination of women and minors under 18 years of age from night employment in cotton manufacturing. Substantial progress in this direction has already been made and indications point to a widespread abandonment of night shifts this year—particularly in the early spring.

This movement has met with popular approval throughout the country, and it is generally recognized that the discontinuance of night employment for women and minors will remove one of the principal grounds for criticism of the industry by social reformers and labor organizers. One significant fact stands out: If the industry does not unanimously and voluntarily follow the leadership of the Institute, then public opinion will certainly force the issue by the enactment of social legislation.



In urging the State Legislature of North Carolina to reduce the maximum work-week to 55 hours, and to legally prohibit night employment in industry for women under 18 years of age, Governor O. Max Gardner expresses in no uncertain words the sentiment of the people of his state. Quoting from his message to the 1931 legislature, we find:

"Occurrences within the past two years have brought every thinking North Carolinian face to face with the necessity for an appraisal of the relationship between capital and labor. We struggled through the storms of 1929; we must set our course with wisdom and courage so as to avoid a repetition of those primary troubles.

"The humanitarian trend in this country towards social legislation which protects the health and welfare of men, women and children in industry is definite and fundamental.

"Any legislation we enact must, of course, be considered in relationship to our neighboring and competing states and with due regard to the present status of both employer and employee, but that fact should not and must not deter us in our duty as our experience and wisdom direct."

Many operatives who are displaced from night employment as a result of the Institute movement will be absorbed in the day shifts. As an alternative, several mills have been paying their former night operatives a "dismissal wage," determined on the basis of previous earnings and length of employment. This policy has the effect of reducing the unemployment evil since it provides displaced operatives with a living wage until they can obtain work in another industry or return to agricultural pursuits.

Curtailed operating schedules, which were the rule

Low Wages Not Desired

"It is not the desire of the southern manufacturer to pay low wages. It is his strong desire and a necessity to reduce the cost of labor per pound of product to the very lowest possible point.

"The ideal situation would be that in which only a few men were employed and each paid a high return. This idea is being sought and partially attained through many means. We have noted the increased speed and greater productivity of newly developed machinery. The additional pounds are obtained with the same or fewer operatives.

"Working conditions have been improved. The surroundings have been made clean, well lighted, properly ventilated and sanitary. Proper temperature is automatically maintained in winter. The air is cooled to some extent in summer. Running ice water is provided.

"Living conditions at home in the village have been marvelously improved in many plants so that a better class of people is being developed and attracted to the work. They are better satisfied and therefore better workmen. . . . Wage plans of the incentive type have been worked out. The object has been to increase the efficiency of the help so that higher wages could be paid." . . . ***By C. L. Emerson,***
Vice-president, Robert & Co., Inc., Atlanta, Ga.

rather than the exception in 1930, again emphasized the disadvantages of the much-abused system of spare hands. The ancient practice of retaining on the pay rolls an unnecessary number of extra workers who must be afforded part time employment has always created a burden on those who must share their working time with these "spare hands." During periods of drastic curtailment, as we have seen in recent months, such a system throws additional load on majority of mill operatives.

With the unemployment situation in every line of industry as critical as it was in 1930, however, southern manufacturers generally realized that part-time employment was the only salvation for a large number of their workers who might otherwise have neither shelter nor food. Although several mills were able to reduce gradually the number of surplus operatives in their villages, the past year was certainly not a favorable one in which to further apply the principles of "extended labor," or the "stretch-out" system.

To an indiscriminate method of hiring workers in many southern mills must be given the blame for the undesirable features of the system of spare hands. It frequently happens that the overseer employs and discharges all operatives in his department and, if the management exercises no supervision over the selection and numerical limitation of workers, often we find that

authority delegated to department heads has been greatly abused. In order to cope with this situation, more than one southern mill has found it necessary to budget the maximum number of operatives that may be employed by each department. In the larger units, of course, the tendency has been to create a separate personnel department which not only handles all employment activities but also has complete charge of the mill village.

Encouraging unemployed textile labor to move back to the farms, an advertisement recently published by The Cotton Manufacturers' Association of South Carolina stated that curtailed production has necessitated a surplus of labor in mill villages and that the cotton mills will not likely be able to "offer employment in 1931 to anything like the number who worked in 1929."

Despite this surplus of unemployed labor in mill towns, southern textile manufacturers by and large have refused to lower their wage levels. Victor M. Montgomery, a leading mill executive of South Carolina, recently declared that half time employment with double pay would give textile workers the means and opportunity to spend more freely and at the same time the industry would be placed on a profitable basis.

In some instances, however, the wage differentials that already existed between Virginia, North Carolina and the other southern cotton manufacturing States, were so great that, as competition increased in severity, mills finding themselves in an unfavorable position were forced to adjust wages to at least partially compensate for the disparity. Examples of this procedure were seen in the wage reductions by the Riverside and Dan River Cotton Mills, Danville, Va., and the Carolina Cotton & Woolen Mills Co., at Spray, Draper and Leaksville, N. C.

According to a statement by the management of the Riverside and Dan River mills, the average weekly wage in their plants prior to Feb. 1, 1930, when the reduction became effective, was $18.69, or approximately 20% above the average of the other cotton manufacturing states in the South. This wide disparity was brought about by the management's policy in resisting the general deflation of wages during the post-war period when other mills reduced their wage scales.

Immediately following the 10% wage reduction at Danville, which applied to everyone in the organization from the president down, representatives of the United Textile Workers of America arrived on the scene and within six months succeeded in practically destroying the modified system of Industrial Democracy which had functioned in the Riverside and Dan River plants for about eleven years.

The bitterly fought strike, which began on Sept. 29, was still in progress when this article was prepared.* For several months industrial strife at Danville has been accorded publicity of every description, but the ultimate failure of union efforts there is inevitable, and even William Green, president of the American Federation of Labor, has proposed that all strikers return to work and leave their differences for later mediation. Recognition of the union by the mill management, in the last analysis, is the only bone of contention in the Danville strike.

The campaign to organize southern textile workers was ill-timed, from the union standpoint. Added to an unfavorable market in cotton goods, surplus of unemployed labor in the southern states created unsurmountable obstacles in the path of union efforts. Furthermore, the United Textile Workers of America committed a tactical blunder in selecting Danville, Greensboro and Spray as the center for organization activities, for it is well known that wages and living conditions there are above the average of cotton manufacturing centers in the South. It is conceivable that a sincere attempt to improve the plight of textile workers in a few "sore spots" would have accomplished more than the futile industrial warfare at Danville.

Considering developments of 1930 in retrospect, we find indications that southern manufacturers are more determined than ever to correct undesirable conditions, and to adhere to intelligent labor policies.

It must be recognized also by employers and employees alike that the next decade will witness further application of the principles of "extended labor," or the "stretch-out" systems. While actual progress toward raising wage levels must necessarily await an intelligent limitation of the number of workers employed, and the arrival of more profitable manufacturing margins, it is reassuring to know that many southern mill executives, such as Victor M. Montgomery, T. M. Marchant, B. B. Gossett, George Harris, and others, feel very keenly the responsibility of lifting the industry out of what is generally known as the "low-wage" class.

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*The strike formally ended Jan. 29.—*Editor.*

A Scientific-Minded Industry

the Most Valuable Result of Cooperative Scientific Research

By Charles H. Clark

Secretary, U. S. Institute for Textile Research

THE textile industry was given the opportunity in 1930 to start organized technical research, as I ventured to predict in these columns a year ago. It took advantage of the opportunity and organized the United States Institute for Textile Research. It carried the preliminary organization work to successful conclusion during one of the worst business depressions the industry has ever experienced.

Deeds, rather than words or prophecies, will now be expected from this organization, yet I feel that there is one valuable future influence of its work that may best be emphasized by prophecy: It is that the direct results of this cooperative research will prove of less importance than its awakening throughout the industry of a scientific attitude toward textile technique and its problems. The manner in which individuals react to any cooperative industrial movement that is efficiently organized and administered is the best test of its value to their industry.

U. S. Institute Progresses

Because of TEXTILE WORLD's published explanation and advocacy of the objectives that are now those of U. S. Institute, and because of its full reports of the latter's organization, I must assume that its readers are fully informed on these subjects. Certain features of its progress and policies since its organization on a permanent basis Nov. 6, 1930, however, may be of interest. It should be evident to those who are acquainted, by reputation or more intimately, with the officers and directors of U. S. Institute, headed by Dr. Samuel W. Stratton, that nothing spectacular is to be expected of them. Rather, that this group of business men, technicians and scientists will conduct the planning and administration of its activities with skill and conservatism; in other words, in a manner to inspire confidence. In a field so fallow with technical research problems it would not be a difficult matter with ample funds to carry a stunt investigation to successful conclusion that would win much temporary applause; but both the funds and the will for such an act are lacking.

Although the Institute's officers and committees are still feeling their way it is going to be possible for them to report substantial progress to the first quarterly meeting of the board of directors. This will include the doubling of membership within the three months; the starting of the foundation fund by life memberships of Pacific Mills and the American Association of Textile Chemists and Colorists; the starting of a survey of textile research in this country authorized and financed by The Textile Foundation; the starting of actual research in participating laboratories that provide their facilities and services free of charge for a limited period, present qualified laboratories being those of Massachusetts Institute of Technology, the Bureau of Standards and Lowell Textile Institute. The donation of these laboratory services is unprecedented in industrial cooperation, and is not only recognition by those institutions of the textile need of fundamental research and of their desire to stimulate interest in it, but also is a gratifying endorsement of the U. S. Institute.

Funds For Research; Not Laboratories

Undoubtedly the U. S. Institute's policy of starting research with existing facilities, instead of delaying until funds are available for its own laboratories, has encouraged the cooperation of participating laboratories and may be expected to influence others to cooperate under this plan. As funds become available, these and other

qualified laboratories and researchers will be assigned problems by the U. S. Institute on a paid basis; and, fortunately, there is no lack of such institutional and commercial laboratories in this country. Not until the Institute's self-perpetuating foundation accumulates a fund of a million dollars or more is it likely that the corporation will consider the expenditure of the necessarily large sums of money for its own laboratories, their equipment and staffing.

This policy is the exact opposite of that which has been pursued in this and foreign countries by industries which have engaged in cooperative research. The British textile industries research associations, for instance, have millions of dollars invested in laboratory buildings and equipment, and their research activities were delayed until such facilities were provided. Controlled laboratories are the ideal, of course, but it is research results and not research laboratories that U. S. Institute is organized for. When it has produced enough results to sell research to a majority of the industry the money for laboratories and the adequate financing of the whole plan will become available; and that total sum per spindle, or per operative, or per any fair participating plan will be found surprisingly small.

The research library and information service, that forms an essential part of U. S. Institute's plan, will also at the start make as extensive use as possible of existing facilities. Instead of investing large sums of money in books and library equipment, the Institute will gradually accumulate source material in the form of indexes and abstracts of research and technical information wherever located, and will arrange to provide members with more detailed photostat or mimeograph copies, or even with complete copies on loan arrangements with other libraries.

The two publications with which the Institute will keep members informed of its own and other current researches and technical developments will also be of slow growth, and will not compete with, nor duplicate, existing services of the trade press.

Seek Moral Support of Research-Minded Men

In its present membership work the Institute is pursuing much the same policy as in its initial research, library and information service. It is cutting its suit from the cloth that is available. High-pressure and expensive membership solicitation is being avoided studiously. The membership activities are concentrated upon bringing together all of the textile men who are already sold on the possible value of scientific technical research to the industry. Whether they join as annual, or contributing, or life members is a secondary consideration. Financial resources are essential, but just now the moral support and cooperation of every research-minded man in the industry is more important. One of the most encouraging features of the movement is the number of such men who have applied for membership without waiting for formal invitations.

Fortunately for this particular movement the business depression is stimulating research-mindedness in textile men. It is stimulating interest in new methods of solving its problems that have proved successful in other industries. It is accentuating the dissatisfaction with present conditions and with unsuccessful remedies that renders men receptive to new ideas. It is stimulating study and adaptation to textile needs of merchandising methods that have enabled other industries to absorb an increased share of the consumer's dollar. It is stimulating search for new uses for existing products and for means of making all of its products more attractive to the consumer, or better adapted for ultimate uses. It is forcing keen search for greater efficiency and lessened cost of buying, manufacturing and merchandising.

The ultimate objective of these and other similar efforts is to take up the slack between productive and consuming capacities.

Until last year there was little individual and no cooperative effort to adapt to the textile industry that method which has been most responsible for the rapid development of the newer industries, and for the renaissance of some of our older industries—scientific research of a fundamental character designed to develop new, basic knowledge. It should have been the first remedy to be applied, and it would have been if textiles had a few great units like General Electric or U. S. Steel, instead of thousands of relatively small units.

The new products and new uses for old products that may be expected from fundamental technical research may not be developed soon enough to render curtailment of textile productive capacity unnecessary; in fact much existing machinery and processing might be found unsuitable for future manufacture; but, eventually, this development of new and basic textile knowledge will almost certainly demonstrate that those economists are right who claim that there can be no such thing as permanent overproduction, and that it is underconsumption and not overproduction that is a normal ailment of the textile industry.

A Research-Minded Industry

With scientific research firmly established upon a cooperative basis, its greatest value to the industry will be educative. Fundamental research aims to produce new knowledge and to discover the principles and laws upon which an industry's technique are based. It is not its function to apply that knowledge. That is the function of the machine builder, chemist, manufacturer or other technician. As the supply of fundamental knowledge increases, the average ability of the industry's personnel must increase proportionately if its full value is to be utilized. Textile schools will have something other than results of experience and of rule-of-thumb methods to impart. Association forums will be something more than experience meetings. Engineers and technicians will be something more than trouble-fixers. The mill laboratory will be as common as any of the mill's present essential departments.

In its efforts to solve its merchandising and mill management problems the industry is already largely research-minded, in that a very large percentage of its merchants, executives and managers are dissatisfied with old methods and are seeking systematically and scientifically for those that are fundamentally correct. Their progressive mental attitude toward such problems is encouraging a similar attitude in its technicians toward the manufacturing technique and its materials and products. This in turn is encouraging suppliers of materials and equipment to scientific betterment of their products and to undertake more confidently than heretofore the development and introduction of new products.

To meet this demand requires something more than occasional fortuitous discoveries of inventors. It requires systematic, scientific effort to create new knowledge, and in the textile industry that means cooperative research—the United States Institute for Textile Research, Inc.

Textile Outlets in Industry

As Viewed by Business Paper Editors—

—in the Realm of Aviation

By Edward P. Warner
Editor, Aviation

TEXTILES will continue during 1931 to occupy an important place in airport and airplane manufacture. There are tendencies away from textiles in some respects, but these may be offset by developing markets in other divisions of the field. The use of metal and plywood covering for airplanes is increasing slightly, but it is still a small part of the total of ships made. By far the majority of ships still have wings and covering of fabric. It is probable that this year the production of aircraft will be larger, which will bring a corresponding increase in the demand for textiles. Parachute production, always an important division as regards textile consumption, fell off toward the end of 1930, but we may look for a pick-up at this end in spring. Meanwhile, there is a constant though intermittent demand for parachutes for the army and navy. For parachutes, silk is still the favored fabric, but cotton chutes are on the market and have a certain commercial application, and rayon also is coming into use; the synthetic fiber is still in the experimental stage in parachute manufacture, but its use may grow. A native material to replace the Japanese silk has been eagerly sought. Increasing output of cabin planes represents an important market for upholstery manufacturers; this demand will continue, and will grow proportionately as production increases.

—in the Automobile Field

By E. B. Neil
Director of Research, Chilton Class Journal Co. (Automotive Industries)

THE large consumption of cotton fabric in automobile upholstery is directly dependent upon the production of motor vehicles, and its consumption in tires upon both their production and use. Present indications are that during 1931 there will be an average increase in production of passenger cars and trucks of aproximately 17%. During 1930 the use of automobiles has continued at a substantial rate, with consequent consumption of tires. It is expected that this will also continue at an increasing rate during 1931. In addition, the increased application of pneumatic tires on motor trucks, which has been in evidence during the past few years, will undoubtedly still further increase the consumption of cotton fabric which is used in their construction.

—Among Rubber Manufacturers

By W. M. Morse
Editor, India Rubber World

TIRE fabric outlook for 1931 is not particularly rosy in view of the fact that tire manufacturing is being more and more confined to a few large manufacturers who make their own fabrics. However, this does not affect yarn demand.

Mechanical ducks, drills and osnaburgs have been in reduced demand for some time and consequently mills have restricted output accordingly. Therefore stronger demand is expected within the next three months, and with it higher prices.

Stocks of raincoat materials are very low and better business in fabrics is anticipated in the early spring.

—in the Machinery Field

By W. W. Dodge
Managing Editor, American Machinist

ALTHOUGH it seems accepted that activity among machinery builders lags behind general business recovery, there is an even chance that the lag may turn into a lead in 1931. Manufacturers are increasingly alive to the dangers besetting machinery obsolescence; a large volume of inquiries for new equipment would presuppose orders in the near future. With increasing uses for textiles in various non-metallic gears, in conveyor belts, in the popular V-belts, there should be an expanding mar-

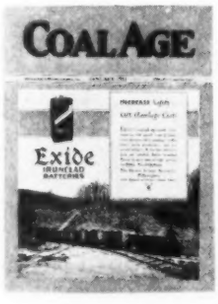
ket. Felt for grease-seals and washers is again coming to the fore. With the increasing drive against noise in shops, textiles will be sought for assistance.

In the metal-working industries, generally, nothing yet takes the place of cloth wipes and waste. It is suggested that the development of oil-resistant rubber for transmission belts would open a wide market for canvas.

—in the Footwear Industry

By Arthur D. Anderson
Editor, Boot and Shoe Recorder

WE ARE seeing, with the beginning of 1930, a new decade of shoe construction. It has come about through the great improvement of modern city life, the perfection of street pavements, automobiles and the higher standards of living. While "nothing takes the place of leather" in the utility and weather shoes, fabrics will, in 1931, have a very important part in the footwear of not only indoors but outdoors. A complete new field of footwear has been opened up by dyeable fabrics—making it possible for a merchant to dye a full complement of sizes and widths in one pattern and tinting the same to the individual needs of the customer. Every woven material —cotton, linen, silk and even fine lace—has its shoe possibilities. But shoe materials must be specifically woven for shoe usages. Fabrics would have made an earlier place in footwear but for the haste of certain silk houses who rushed in with loaded dress weights, suitable for attire but not adaptable to the strain of footwear.



—in the Coal Industry

By Sydney A. Hale
Editor, Coal Age

PACKAGING coal at the mines is no longer a dream, and it represents an important potential market for textile consumption. In the Southwest, and in the Rocky Mountain region, packaging of fuel to be consumed in the home already has been started in a small way with fibre-board containers. With 100,000,000 tons of coal used annually for domestic heating, a substantial portion of which might be packaged if certain difficulties were overcome, the possibilities are attractive. If packaging is to be adopted, the additional cost of such treatment must be low. A packaging medium must be found or developed which will be both dust-proof and abrasive-resistant. Leakage of flour or cement is not serious from an appearance standpoint because the material is whitish. Leakage of coal through a package means dirt, and so destroys much of the appeal of packaging. Moveover, the sharp edges of coal would cut fragile fabric. Possibly the solution will be found in an outer cloth bag which can be returned to the shipper if necessary, and an inner paper envelope which will be dust and abrasive-proof.

—in the Luggage Field

By R. W. Dow
Editor, Trunks and Leather Goods

THE textile field is not wholly awake to the possibilities of the hand-bag and luggage industries as a textile consuming market. All these products, including suit-cases, are lined with textiles, and the demand is increasing this year. Present demand is leaning toward textile-lined overnight bags. Hand-bags are important in two ways: both as regards linings and also as regards the new stylish fabric handbag which is part of the fashionable woman's ensemble. The textile manufacturers could develop this field more thoroughly by selling direct to the luggage industry; at present, this is done by small jobbers. It represents substantial yardage for the textile mills.

—in Chemical and Allied Fields

By S. D. Kirkpatrick
Editor, Chemical & Metallurgical Engineering

CHEMICAL and allied industries of the process group will use more textile products in 1931 than during the year just closed. This is particularly true of the rubber tire and artificial leather plants that suffered from long inventories in 1930 and a slow demand from the automobile manufacturers. There was an active call for filter cloth for process operations in most chemical plants during the past year and this is likely to continue for some time to come. The process industries are in a firm position, rating among the most profitable industries in 1930, and we look for an upward rebound this year. There has been little or no letup in the call for textiles for testing and other laboratory work, and also for textiles as a base for refabricated products.

—in the Food Industry

By. L. V. Burton
Editor, Food Industries

THE food industries should continue to be active consumers of various textiles during 1931. Cotton bags and bag liners are perhaps the most solidly entrenched line, but there are numerous other fabrics used, including burlap, cheesecloth, jersey stockinette, muslin, and jute. The increasing interest in frozen foods is resulting in a change of method; more meats are likely to be cut at the packing-house, chilled or frozen and shipped in package form, which may eventually mean a declining call for textiles from the meat industry. Apart from this one trend, textile manufacturers can look for a steady de-

mand from the food group. Our industries being essential, felt the 1930 depression less than most, and really enjoyed a satisfactory year, except in such sub-divisions as candy and sugar. We are confident that 1931 will be even better.

—Among General Manufacturers

By G. S. Brady
Managing Editor, Product Engineering

PRODUCERS of laminated resinoids are now being extensively employed for molding gears, clock cases, trays, fan blades, and other articles, and represent a recent quantity market for textiles. Two varieties of these laminated materials are being made, one employing paper, the other duck or muslin as base. Muslin is used for the finer grade, while an 8-oz. cotton duck is employed for material going into fabrication of machine gears, etc. With an ever-growing field of use of these laminated resinoids, in the replacement of metals, fabric consumption for this purpose should be increased materially. Important markets for textiles are the automobile tire industry, and the automobile body industry; the latter trade uses immense quantities of pyroxylin-coated fabrics for automobile tops, seatings, and leather substitutes. Sateens and ducks are the usual base fabrics for these coated fabrics. A new field for canvas is with the makers of V-belts for power transmission. Crinoline, long used as a base for dictating machine records, has prospects of a better market, due to greater use of these machines. Among the small uses of fabrics which mount up to large totals are: silk and rayon screens for radio loud speakers, baize and felt bases for lamps, telephones, and instruments, and silk linings for vanity cases and similar articles.

—in Radio, Sound Pictures, etc.

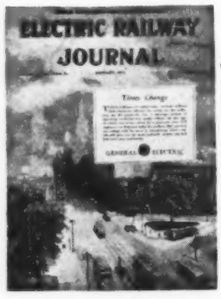
By O. H. Caldwell
Editor, Electronics

IN the electronic group of industries are included those many new activities built around the vacuum tube and its associated circuits. Prominent on the list are radio, sound pictures, telephony, picture transmission, television, thereapeutics, industrial control, power transmission, metallurgy, measurements, etc. In this electronic group, whose total annual business reaches over a billion dollars, many uses are found for textiles and textile products. Literally hundreds of thousands of miles of wire is insulated with cotton and silk, and finished coils are formed up with insulating and varnished tapes. Loudspeakers use felt for baffles and gaskets, and silk sheets for covers. Sound-picture screens for the 25,000 public theatres and small screens for the 250,000 home movies, requires acres of woven cloth. Textile products are used in instrument mountings and instrument casings.

—in the Mining Industry

By A. W. Allen
Editor, Engineering & Mining World

TEXTILES are used in the mining industry principally in the following forms: filter cloth, sacks for concentrates and high-grade ore, gold recovery blankets, pneumatic flotation-cell blankets, mine ventilation tubing, temporary brattices, and workman's overalls. They also enter into the manufacture of conveyor and power belting, of air and water hose. Consumption of these commodities in 1931 is not likely to exceed that of 1930, but on the other hand, neither is there any reason to look for a decrease.



—in the Electric Railways

By John A. Miller, Jr.
Editor, Electric Railway Journal

IN the electric railway field there is a light but steady demand for canvas for car roofs and a considerably greater call for plushes for seat upholstery. There was a decline in the purchase of new electric cars during 1930, and to that extent the textile requirements were reduced; however, the chief textile call comes from maintenance, and in that respect the year was normal. The upholstery has to be replaced frequently, and represents a moderate market for textile manufacturers. Recently numerous important orders were placed for the upholstery of cars with plush, and we may look for a steady demand of this kind during 1931.

—in the Electrical Field

By L. W. W. Morrow
Editor, Electrical World

TEXTILES, or the components of which textiles are made, find a variety of applications in the electrical field such as: Varnished cambric insulation of cables and buses; braided coverings for insulated wire used indoors, outdoors, or on transformers, motors, generators and other rotative equipment; insulation of fine wire used in making magnets, solenoids, etc., required for relays, contactors, meters, etc.; insulating tape; lamp shades and vacuum cleaner bags; tarapulin coverings for equipment during construction; power plant waste; binding heat insulation on steam and hot water pipes and fire protective coverings on cable; composition slot linings for windings on rotative equipment; varnished cambric bushings; flexible couplings; composition gears and flexible tubing for wires..

Buying Textile Machinery

on Long-Term Credit

By Henry G. Lord

President, Bragdon, Lord & Nagle Co. Division, McGraw-Hill Publishing Co.

The proposed plan outlined in the following article has been discussed in many conferences that I have had during the last few months with bankers, textile manufacturers, credit companies and machinery builders. It may be said to represent a composite picture resulting from many carefully considered suggestions made by the different interests involved. The reaction has been distinctly favorable to the general idea and plans are under consideration for carrying it into practice.—*Henry G. Lord.*

FOR several years it has been increasingly difficult for textile mills to find the necessary capital for the purchase of modern, up-to-date machinery. During that same time there has been an unusual development of textile machinery and accessories. That usually happens in every industry during a period of depression, as the machinery builders have more time for research.

Most textile manufacturers are in a receptive mood towards replacement of obsolete machinery with up-to-date equipment, for they realize that it means from ½ to 3c or more per pound saving in costs.

There are, of course, a considerable number of mills whose financial position is such that they can buy whatever machinery appeals to them without impairing their net quick position, but the great majority are not so fortunately placed, and the situation is approaching a point where a small number of mills will soon be in a position to dominate the market from a price point of view because of their better equipment and lower cost of production.

The liquidation of surplus and inefficient machinery has been going on for the last ten years but is not yet completed, and no plan for the improvement of the economic position of the industry should contemplate keeping all of these inefficient units in operation, but on the other hand there are very many mills which are well worth bringing up to date and whose production is needed to supply the normal demands upon the industry.

The banks today are not disposed to lend money for the purchase of replacing equipment on any basis of long-time payment, if it will impair the net quick asset position. Although practically no value is allowed for the plant in extending credit, yet a fine net quick asset position can very soon be impaired if the plant is not in condition to meet the competition of the better equipped mills which will inevitably fix the market price in a normal market. It would seem, therefore, as much to the banks' interest as to the mills' that plant equipment should be maintained at the highest point of efficiency and they should consider favorably any reasonable plan for financing machinery purchases through other credit channels if they are not willing to do it directly themselves.

It has been estimated that about 10% of the cotton mills of the country are in excellent repair with modern replacements up to date; that 30% are in good repair with some replacements, and about 60% in what might be called running condition. Possibly the same percentage might be applied to woolen and worsted, knitting and silk mills. The present problem is how to bring up the second class mills to first class condition and such of the third class as might fairly be entitled to assistance for the replacement of obsolete machinery.

Possibilities of a Credit Plan

The textile machinery builders have been fairly liberal in extending time, but their resources are not sufficient to meet the real needs of the industry today for modern equipment if payment is deferred over several years and they should not be called upon to act as bankers. Why should not credit be supplied through the mediums used in the automobile, agricultural and railway equipment and machine tool fields?

Some years ago several of the credit companies made a study of the textile situation but their approach to it was through the machinery builders. I thought then and still think that the proper approach is direct to the textile manufacturers. If the credit were extended direct to the mill with the agreement of the machinery builders to cooperate, it would not only permit the financing of large purchases of important units of equipment from the big builders but it would facilitate the purchase of smaller units of machinery from various makers, transactions which in themselves might not be large enough to warrant special credit arrangements, but which in the aggregate would amount to a considerable sum that might be financed by a credit arrangement between the mill, the machine builder, and the credit company.

The transaction should be considered from the standpoint of the buyer's credit and need of the equipment rather than solely from the machinery builder's desire to sell machinery, and the mill's credit should not be judged wholly upon its balance sheet and net quick position. For the purpose of such a transaction other elements are fully as important, indeed more so. The question of management, state of present equipment, manufacturing processes and methods of control, the merchandising methods employed, the standing of the

company's product in the market, its policy in regard to the maintenance of price, the need of the machinery and the saving to be made by it, the length of time that would be required for the machinery to pay for itself and similar factors should be taken into consideration by the credit company extending the time payment. Very probably an engineering survey and report should be made to determine the extent and probable profit of the installation.

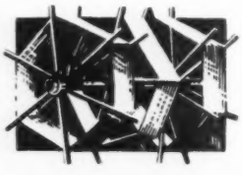
If a mill qualified under such a proposed plan the credit company might extend credit for the purchase of improved equipment payable over a period of several years at a reasonable rate of interest, the loan to be repaid in monthly, quarterly or semi-annual installments. The mill would make a reasonable cash payment in advance and give its notes to the machinery builders who cooperated in the plan; the builders could discount them with the credit company; the credit company would retain a lien on the machinery until paid for. The new machinery should be earning enough to cover the cost in most instances.

There has been some feeling of reluctance to use the facilities of the credit companies for fear that it might be considered an evidence of weakness. When the automobile industry was in its infancy, there was a similar feeling among the purchasers of motor cars, but today 70% to 80% of automobiles are sold on the installment purchase plan which is now recognized as a standard method of financing, and it is so recognized in the other fields mentioned. With the necessity of replacing obsolete machinery becoming more pressing every month, it would seem as if this objection should have little weight in view of the great potential benefits that might be realized.

There is a prevailing impression that the cost of long-term purchase financing is excessive but the investigation that we have recently made disclosed that the expense is not unreasonable. A mill which would qualify for such a loan could undoubtedly arrange deferred payments on a 6% basis and surely the benefits to be derived would justify that rate.

The question has been raised that even the replacement of obsolete machinery with modern equipment would tend to increase an already too large production. This might be true at first to a limited extent, but the ultimate effect would be to hasten the elimination of the least efficient units through their inability to compete. No such credits should be used for expansion but only for replacement, and it would be still more desirable if the machinery replaced should be scrapped and not resold.

With the recognized need and the general desire on the part of textile manufacturers to replace obsolete machinery with the improved equipment that is now available, it would seem to be for the economic benefit of all concerned that some plan for extended payment should be adopted which will be acceptable to the manufacturers, to the machine builders and to the credit companies, and which will have the approval of the banks. It will help solve a serious problem which now confronts the industry.



Improved Textile Machinery Demand

For Plant Modernization, Forecast for 1931

1. Dollar volume of textile machinery sales in 1930 was approximately 33-1/3% below 1929.

2. In the latter months of the year, improved demand and inquiry were noted.

3. Majority opinion indicates expectation of steady and healthy expansion of business in 1931.

4. Demand has emphasized improved equipment, for replacement purposes, rather than machinery for plant expansion.

5. Machinery manufacturers have invested time and money in research along lines of redesigning and improving their products, and believe this investment will prove to be a paying one.

THE above conclusions are drawn from TEXTILE WORLD's survey of current trends in textile machinery demand.

The estimate of 33⅓% reduction in 1930 sales, as against 1929, is of course a rough one and subject to all the qualifications which apply to any estimate based on dollar volume, and on reports from so many and varied branches of the industry. However, it was interesting to note how closely most of the figures from the different manufacturers checked.

Nor is this reduction of one-third either surprising or alarming. It has been recognized that the situation in textiles discouraged rather than encouraged plant expansion, and that the bulk of the machinery business to be

expected was for modernization of existing equipment. In view of the difficulty of compensating, in this way, for large unit sales for the equipment of new mills, and also in view of the problem which many textile manufacturers faced in financing machinery replacement, it is encouraging to note that sales held up as well as they did.

Particularly significant were the reports of improved demand during the latter months of 1930. This further substantiates the general conviction that the industry has definitely made a turn for the better. Here are a few representative comments:

✦ "We are already beginning to feel the uplift in orders."

✦ "The demand and inquiries for textile equipment during the last three or four months of 1930, and still continuing, were better than they had been for some time past."

✦ "During the last 60 days, we have had reason to become quite optimistic over the business situation in the textile industry. We have had a much larger number of orders."

Naturally, there is no unanimity of opinion regarding the outlook for 1931. Some companies are frankly pessimistic. However, the majority of machinery manufacturers who replied to our questionnaire anticipate decided improvement over 1930. Estimating the extent of that improvement is difficult. One company is using a factor of 35% increase, in dollar volume, in setting its sales quota for the coming year. Most replies were not as definite as this; however, from their tenor, we would say that general expectation is for a smaller increase than this—possibly not to exceed 25%.

Modernization Emphasized

Throughout the replies there was insistent emphasis upon the increasing disposition of textile manufacturers to study their plant efficiency, and upon the need for even greater activity in this direction, if the industry is to make the progress predicted for it. One company makes the following interesting point:

✦ "If the textile industry will take stock of its equipment, and think of its machinery in the same terms as individual owners think of their automobiles, and replace machinery on the same basis, then the prospect of sales of textile machinery in 1931 would be excellent."

Other thoughts expressed on this phase were:

✦ "The most encouraging sign that we find is the disposition on the part of the industry to make improvements in its operating machinery."

✦ "It is not desirable, at this time, to add to present equipment, and it is our aim to replace old obsolete machines rather than add new machinery. . . . Briefly, we intend to emphasize the importance of obsolescence and, by following such a policy, help to stabilize the industry."

✦ "There is, without doubt, increasing disposition on the part of the mill operator to more thoroughly investigate improved machinery."

Aggressive Development Programs

Certainly, the machinery manufacturers are trying to do their part. The letters reflect more activity in improving equipment than has ever existed before. In addition, it is interesting to note that a number of the companies are expanding their own production in anticipation of broader replacement demand. The following comments, from the replies, reveal this aggressive attitude:

"We have been spending a good deal of money in improving our product and in bringing out new machines and devices which we hope, as time goes on, will be justified."

✦ "The reports of our agents in regard to future business have been so encouraging as to justify us in making substantial additions to our manufacturing plant which will increase production to a substantial amount and we believe and expect that during 1931 we shall fully employ this additional equipment."

✦ "The past year has had one very good effect on our business—it has given us time to remodel, redesign and bring out new machines, and we feel we are in far better shape to do business now than we have ever been."

✦ "As for our opinion of the outlook for 1931, you may perhaps find your answer in the fact that during the past 18 months we have spent well over $100,000 in the development of new and radically improved machines. We assure you, were we not confident that conditions will change for the better (which, of course, comes slowly), we would not have gone ahead as we have in the development of these new machines."

✦ "The machinery demand is increasingly special and requires greater research and more and more engineering ability."

Better Textile Marketing Needed

Probably no group of men has found it necessary to study textile conditions more carefully than the machinery manufacturers. Consequently their opinions should carry particular weight.

In their replies to our questionnaire, they departed from the problem of their own sales to emphasize the need for more attention to marketing in textiles. They reiterated the belief that there are still too many textile manufacturers who are production-minded but not sales-minded, and that in these days a manufacturer, to be successful, cannot divorce the two phases. It was also emphasized that more inclination to insist on a fair profit is absolutely necessary if the industry is to reap the full benefit of the improved outlook.

Is the movement toward textile machinery development and plant modernization being reflected in actual or prospective orders for new equipment? Machinery manufacturers were asked this question by TEXTILE WORLD. On the basis of their replies, submitted in confidence, the accompanying survey of trends has been prepared.

Noteworthy Machinery Development

of Recent Years Marches Unretarded Through 1930 into 1931

By Edwin D. Fowle

Associate Editor, TEXTILE WORLD

IT IS a peculiarity of the times that, as the textile fiber is drawn and whirled into yarn, is thrown and trapped into fabric, and is colored and garnished into a commodity, unusually critical eyes observe it. Lack of industrial expansion has killed the demand for the old line of machines. Something new will go—something that will save labor, increase production, reduce waste, improve quality. Brains are coaxed to move just a bit further than they have ever gone before. An idea is caught. Compasses, triangles, and T-squares pin it down. Machine shops turn into action. The new machine emerges.

Thus it is that 1930 has written another great chapter into the amazing story of progress in the mechanical technique of textile manufacturing—a story beginning about the middle of the third decade, twentieth century, and ending—when? It failed to begin until a few years after the depression arrived; its momentum will probably carry it a few years after prosperity returns.

Preparation for Spinning

To facilitate accurate studies of the raw stock, there have been developed a new mechanical cotton-fiber sorter intended to facilitate stapling; an inclined-plane serigraph, based on principles borrowed from another industry, for measuring raw-silk nature; and an apparatus for accurately grading silks by means of the photo-electric cell. A new apparatus for rapidly soaking raw silk circulates the emulsion and affords thorough penetration with neatsfoot and olive oils. New wool-scouring equipment purifies the liquor from the first bowl centrifugally and returns it into service, reducing stream pollution. Apparatus employing trichlorethylene on the solvent principle removes pitch and tar from wool.

Advancing a step further into the early processes, we find a new cotton-roving-waste opener with two cylinders for better opening; a bale breaker with doffer, pin apron, and pin cylinder readily accessible; entirely automatic oil-spraying equipment for raw cotton; a self-cleaning high-production fearnaught picker; and a combination feed hopper and reserve box capable of dealing with a large amount of lofty, well-opened cotton. The wasteful discharge of humidified air in opener and picker rooms is eliminated by a new system of forcing exhaust air through filter bags into recirculation.

Among new lapping developments are an improved one-process picker in which a governor replaces the hopper rake for better control of the distributor; a one-process picker equipped with calender knock-off motion for preventing injury to gears from lumps in the stock; and a device which automatically doffs the full lap and inserts a new lap rod.

For the carding department has been brought out a new combination of garnett and card capable of producing carded roving direct from picker rags, clips, and thread waste, and from wool mixes containing a high percentage of hard-end waste. A new woolen card with 20-in. cylinders passes the stock around a cylinder three times where necessary, eliminates practically all stripping, and affords a production equal to a standard set of large cards. Other carding improvements include a worsted card with easily adjusted licker-in, burr rollers, and divider; a cotton card with only 48 flats and raised licker-in; and a new stretch-resisting card-clothing foundation.

New developments in the processes which lie between carding and spinning include a new machine for winding two different colors of woolen roving on one spool to permit uniform tension in the spinning; a cotton comber with an auxiliary nipper knife, designed to permit the use of an increased weight of lap, and with a flexible top comb, designed to improve combing and prevent displacement of the leather detaching roll or the top comb blade when lap-ups occur; a cotton roving frame with chain-drive gearing and totally inclosed ball-bearing differential motion; self-oiling bobbin gears for roving frames; and an improved line of worsted drawing machinery in which the carriers are actuated by sliding chains self-adjusting when the ratch is altered.

Throwing and Spinning Equipment

The year has proved an interesting one to the silk throwster, partly because of the large demand for high-twisted yarn, which has taxed the production capacity of his machines, and partly because of the sudden and general advance made in the design of throwing equipment. For the first mechanical process in throwing silk, an improved winder has been introduced, equipped with oilless bearings throughout, improved traverse fingers, and a unit-assembly drive. New twisters for silk and rayon have a large number of spindles in a given space, belts which are replaced endless, simple twist-gear construction, self-lubricating traverse cam and roller, twist take-up rolls driven by the belt take-up pulley in a unit assembly, smoothly running spindles, individually adjustable spindles and thread guides, and vertical back shafts equipped with steel-packed ball bearings. Each deck of a new double-deck twister is driven by a separate motor.

In an improved up-stroke twister designed especially

for rayon, large packages can be run at speeds as high as 10,000 r.p.m., the spindles being driven by tapes and all moving parts being oiled automatically. An improved doubler-twister for silk or rayon has each builder ring mounted on its own bracket for individual adjustment. A new silk redraw frame embodies a unit-assembly drive, provision for readily adjusting belt tension, a step pulley for two changes of speed, a lock for preventing accidental displacements of the traverse bar, springs on the spindles to compensate for vibration, and oilless bearings.

Two new spindles for silk-throwing machinery have appeared. One has a ball-shaped tip, provisions for circulating oil and reducing the frequency of oiling, and a spindle lock for holding the spindles during doffing. The other has a roller-bearing spindle designed to run at high speed, to reduce power requirements, and to prevent oil pumping and seepage. A combined fiber and yardage tester for thrown silk runs thousands of yards over an aluminum wheel equipped with a direct-reading counter and a positive stop motion.

One of the most interesting of the year's innovations in cotton-spinning machinery is the new ring-spinning frame equipped with inclined mule spindles and capable of producing yarn as fine as 250s. A long-drafting system has been provided with a new cradle for positively guiding the leather bands, wider bands, a small revolving clearer inside the top apron, wider spacing between middle and back rollers, and adjustable back bar blocks and roll slides.

Other improvements in cotton-spinning equipment include a new centrifugal-clutch spindle designed for greater durability; a comparatively light-weight steel ring rail holding the rings by means of springs; a casing inclosing the side rail to reduce cleaning; a quietly operating and durable builder heart cam; a long-draft creel permitting two-thirds of the roving bobbins to be placed on the lower shelf; ring rails in sections, eliminating sagging; and several travelers and rings designed for better lubrication and less injury to the yarn.

In the field of worsted spinning we find a new frame which can be fitted with flyer, cap, or ring, and which is capable of spinning four different counts at one time. A new cap frame for spinning French-drawn roving is said to be suitable for 30s to 80s counts and to deliver a yarn which compares favorably with that from the worsted mule. At one of the large machinery expositions was shown a combination of spinning cap and ring employing a self-threading traveler and intended to afford the high speed of cap spinning with the smoother yarn and larger packages more commonly attained in ring spinning.

A new woolen ring frame employs a stationary ring rail and a movable spindle rail, an arrangement for cleaning the press rolls readily, and provision for easily changing tube speed, production, lay, turns per inch, and direction of twist. Quick changing of direction of twist is allowed by another woolen ring frame, employing a slip clutch for gentle starting, a clutch for facilitating draft changing, a wind-down mechanism with compound gear for making the work of the operator less difficult, and spindles with longer shanks. Quick changing of the direction of twist on roving and spinning frames is made possible by the use of a new reversible silent chain capable of driving on either or both faces.

On an improved two-ply dull-roll trap twister for worsted, an improved locking device prevents the roller on the stationary spindle from swinging back. A portable machine for cleaning and renapping top-clearer cloths helps to maintain satisfactory spinning.

Winding and Warp Preparation

Besides the new silk winder for throwing, previously described, a number of very interesting developments in winders appeared during the year. These included a high-speed winder without reciprocating parts, which guides its yarn by means of grooves in the driving drums; a rayon or silk winder with a simplified drive designed to eliminate straining of the yarn when starting and with gears in place of the gainer belt to maintain a positive relation between cone and traverse guide; a bottle-bobbin winder with individually driven and adjusted spindles; a high-speed machine for winding heavy yarns in packages 10 in. in length; and a doubler employing over-end magazine creels, capable of doubling five ends for the tire trade. Other winding developments of less importance include new slub catchers, new moistening and conditioning equipment for silk and rayon, and positive gearing between spindle and traverse for heavy filling yarns. On a new reeling machine for silk and rayon the total yardage of the skein is positively controlled.

Developments in warping include the application of a well-known warp stop motion to high-speed warpers; new equipment for the high-speed warping of rayon designed for constant tension on the thread; a high-speed warper of reduced height for the convenience of the operator, on which the back comb has been eliminated; and a high-speed warper with a friction let-off which varies the tension according to the size and weight of the beam, and with powerful internal brakes and a sliding-bar stop motion which opens the warp where an end is down.

In the warp-sizing field have appeared a combination warper, beamer, and slasher for rayon-ribbon warps, equipped with variable-speed transmission and a temperature-control device; a warp sizer for spun silk or rayon equipped with an automatic temperature control and a high-pressure quetsch; a cooling roller for rayon-warp sizing, intended to eliminate contraction of the warp on the beam and given an oscillating motion for hard winding; a cotton-slasher press roll which can be raised or lowered to bring it in line with the barrel of the beam when the friction is applied; and a new toggle motion which permits one man to lift the heaviest slasher squeeze rolls with ease and speed.

Weaving Equipment

Last year several new looms were added to the interesting line of weaving machinery which has been developed in recent years. One of these is a simplified silk loom constructed with 61 fewer parts than the previous model and having among its features an end-thrust-eliminating clutch with cast-iron internal expanding rings, a cap-screw fastening for the crankshaft gear to facilitate timing, a batwing motion and picking shoe designed to provide constant acceleration to the shuttle, and an arrangement of the beam stands to accommodate three different lengths of beam. A new cotton loom, said to operate successfully at 200 picks per minute, is equipped

with powerful brakes; permits the use of larger rolls of cloth, larger yarn beams, and larger shuttles than previous models; embodies a new friction clutch without end thrust; and employs helical gears on its take-up drive.

A 4x1-box automatic worsted loom has a practical speed range of 130 to 160 picks per minute and is capable of handling certain constructions from 4 oz. to 20 oz.; among its important features are one-shot lubrication system, asbestos-lined brakes, and high roll take-up. A woolen loom has been refined. Interest has been aroused by the crude first model of a circular loom, which is complete in all details except a method for automatically replenishing the filling.

Other weaving developments include a warp stop motion utilizing the heddles as drop wires and giving the weaver a clearer view of the back of the warp; a reed holder for silk looms adjustable for either fixed or loose reed and pivoted at the normal center of balance without the necessity for a counter-balance; an automatic let-off which eliminates friction as a tension means and permits easing of the warp by a natural oscillation; an improved silk-loom take-up with helical cut gears and with provision for holding the ratchet wheel and other take-up parts in the correct position for starting the loom without adjustment when the defective pick has been removed; provision for allowing the woven piece to be taken off during the operation of the loom; a dobby jack with removable hook for easy replacement; a filling feeler consisting of a spring at the shuttle spindle which reaches through the shuttle to plates built into the box swell, eliminating jabbing and bruising of the silk; a silk cone motion with provision for convenient leveling of harness; ball-bearing whip-roll poppets; a new lay motion which affords greater retardation and dwell at suitable times, allowing the use of a larger shuttle; a new filling-replenishing attachment said to be applicable to any type of loom; and a new 16-hook double-lift selvage jacquard.

Various new and improved loom accessories include an improved quickly adjustable harness strap without holes; improved loom pickers of the type employing Textolite; a reinforced lug strap; an improved non-slip mail-eye harness; a drop wire with extremely smooth finish at the eye; a pick counter which can be reset to zero at the end of each pay period; and a pick counter combining resetting dials and non-resetting totalizing dials for permanent records.

A harness for cotton broadcloth with two sets of heddle bars per frame, one higher than the other, is designed to reduce crowding in reed. Slender heddle wires permit weaving broadcloth on fewer harnesses. Improved shuttle eyes and tensions facilitate threading and improve uniformity of weaving.

Refinements have been made in a warp-twisting-in machine, and a new warp-tying-in machine has been developed for high-twisted silk or rayon yarns. Another warp-tying-in machine is suitable for use in narrow loom alleys. A German device makes use of the photoelectric cell for cutting jacquard cards automatically.

Knitting Machinery

During 1930 three concerns began the knitting of full-fashioned hosiery on unit machines, by means of which the feet are knitted on the legs without removing the legs from the machine. The stocking is not the equal of the usual type knitted on two machines, and the ultimate success of these enterprises remains in doubt. A simplified speed-range lock has been applied to the new variable-speed motor drive applied to full-fashioned hosiery machines in 1929.

In the field of circular hosiery a warp-stripe machine has recently been improved in design capacity, it now having fourteen steps in each feed and twelve wraps; this machine permits two body colors, ends a clock pattern at any desired point in the foot, and permits a large number of color combinations in the stem of the clock. Another wrap-stripe machine, capable of making a differently colored wrap on each needle, patterns by trick wheel and shogging of finger cylinder. An improvement in a circular hosiery machine knits a gusset-type toe, narrowed and well fitted to the foot without a seam. Reverse sinker and wrap around are combined in another circular hosiery machine. A new automatic rib machine for half hose, golf hose and misses' hose, knits ribbed fabric to the toe and is equipped for swinging the dial back and returning it to position without requiring retuning of the machine. Another automatic, seamless, rib hosiery machine makes true one-and-one tops with true French welts, and any combination of single or broad rib leg for half hose, golf hose, and ladies' and children's stockings. A two-feed French-welt ribber selects and joins yarns with weaver's knots.

In a multi-design, single-feed outerwear machine the cylinder may be shogged in either direction without floats. The designing ability of a well-known multiple-stripe spring-needle outerwear machine was extended to eight colors. A jacquard circular outerwear two-and-one bottom machine acts automatically in either direction, making one-and-one striped rib, jacquard effect, and twill back. Tight-mesh fabric of light weight is made on a new interlock machine.

A new automatic, jacquard, flat knitting machine is capable of making fabric having the same design on both sides. Another flat machine affords combined use of several familiar designing methods. An automatically shaped gusset in elastic webbing can be made on another new flat machine. One improved link-and-link machine is equipped with an automatic vacuum oiling system, and another guards against bending of needles during racking. Many different shades produced on a flat knitting machine are made possible by an intarsia attachment fitted with twenty carriers.

An improved electrical stop motion for hosiery knitters is adaptable to a variety of machines. There were many improvements in seamers, loopers, topping tables, examining devices, float cutters, moisteners, mending devices, drying forms, and other auxiliary knitting-mill equipment. Many advances were made in sewing machines particularly. An improved four-head, sixteen-carrier, wire-covering braider has individually removable reels and individual traverse motions.

Bleaching, Dyeing, and Finishing

Bleachers and others concerned with the cleansing of fabric were interested in the important announcement of the continuous kier, which in six hours subjects the cloth in either open width or rope form to boiling in alkaline

liquor, spraying, and squeezing. Another kier, of a more familiar type, is equipped with both pump and percolator circulating systems, usable separately or together.

Other new or improved cleansing equipment for piece goods includes a cloth washer employing a sheet spray device and a suds box of the water-tight inclined type, returning the soap to the tub and sending the dirty water to the sewer; a slack-loop bleach-house washer with counter-current flow principle for saving water, employing a suds box of the character just described; a washing and scouring machine with easily replaceable main squeeze rolls; and a metal-clad cloth washer with large suds box and provision for making adjustments while the machine is running.

Bleachers were interested in a new device for determining the percentage of available chlorine in hypochlorite bleach liquors. Transite was applied to the lining of bleaching tanks.

New equipment for the dyer included a new skein machine designed to secure penetration of the liquor throughout the load with a gentle flow of the dye bath; machines for dyeing sample or small lots of skeins; a Monel-metal holder for treating yarn in package form previous to dyeing; two rotary machines for dyeing hosiery in small lots; a new paddle type of hosiery dyeing machine; a jig with variable-speed motor on each beam; a single-roll jig for vat dyeing, giving constant speed; a silk dye beck designed for tightness of the slats at all times and extensive adjustment of the bolts holding them; a padder for vat colors with Monel-metal parts and pressure equalizer; a Monel-metal ventilating duct; improved mixing and spraying equipment; improved color analyzers employing the photoelectric cell.

Heavier color pans and steel bottom plates have been applied to a well-known printing machine. A new multi-coloring air brush designed for the application of two, three, or four colors at the same time is applicable to the spray printing and coating of textiles. Applying the blanket on an eight-color printing machine has been simplified. A new machine for printing floor coverings is capable of making fifteen different impressions on the body and a like number on the border. Especially for photogravure patterns, a new one-color printing machine has been developed. A full-width print washer and dryer employs individual automatic control of each squeeze drive. A new engraving machine operates on a jacquard principle.

Mercerizers were interested in a new centrifuge especially designed for mercerizing loose cotton; apparatus for mercerizing cotton roving wound on perforated tubes; an evaporator for concentrating mercerizing liquor; and a chainless mercerizing machine recently introduced from Europe. Apparatus was developed for treating textiles with ozone for increasing tensile strength. An improved napper guards against stretching of the cloth. A smaller model of the 1929 high-production fulling mill and a new shear capable of handling carpets and rugs up to 20 ft. in width and equipped with air-driven selvage trimmers were also called to the attention of wool finishers. On the mantle steamer provision has been made for preheating both the fabric and the mantle. A large cylinder has been added to an open steamer. A new tenter clip will hold two layers of cloth at one time.

The semi-decating machine was made applicable to the finishing of rayons and silks. Effect of full-width saturation without excessive tension is claimed for a new multi-purpose silk and rayon wet-finishing machine. A friction-let-off back-sizing unit was developed for Axminsters. Improved dryers included more compact and efficient raw-stock, yarn, and cloth types. A packingless drying-cylinder bearing is designed to eliminate oil stains. Various extractors were brought out, including vacuum types in which the slots may be adjusted for fabric weight and width, and for openness of weave. One builder of centrifugal extractors now advocates the use of a number of small machines in the place of a few large ones to keep the operators constantly busy.

New silk calenders included a durable and easily operated three-roll type and a magazine type designed to facilitate the quick changing of rolls. A new Palmer machine may be used with any length or type of tenter. An electrical device detects metallic particles embedded in fabrics previous to the goods entering the finishing machines. A new tentering and drying machine for piece goods delivers the fabric at room temperature and requires only one attendant.

A positively controlled pre-shrinking machine applies tension to the filling thread in drying, giving the warp an opportunity to contract without destroying the luster of the fabric. Another pre-shrinking machine employs high-pressure steam presses. A new machine for opening piece goods from rope form to full width is particularly applicable to silk weighting. A new cutter permits cutting fabrics either straight or on a bias. A new low-model rolling-up machine may be used for coated fabrics. A device applicable to the reeling and unreeling of textiles in various forms maintains uniform tension during the changing diameter of the package. A number of improvements have been made in mill and garment sewing machines. A light-goods inspecting machine is equipped with reversing motion and variable speed.

An improved drying and processing machine combines the festoon and roller principles of conveying, employing a "floating" roll which prevents buckling and wrinkling and affords uniform and adjustable tension.

For knit goods a new finishing machine permits drying, tentering, and calendering of tubular fabric in one operation. There have also been developed a new upright finisher, a new ironing machine for rayon underwear, a new pocket creaser distributing the heat correctly, and a new slitting machine for cutting rolls of tubular fabric into strips.

New testing equipment includes devices for determining strength, weight, moisture content, fabric porosity, fabric smoothness, fabric draping qualities, and fabric resistance to abrasion.

During the year appeared new apparatus for heating, cooling, ventilating, and conditioning mill rooms, including new controls. A new machine conditions yarn on perforated cones or tubes. Developments in power transmission and other auxiliary equipment include new or improved leather belts, V-belts, chain drives, variable-speed transmissions, bearings, motors, motor controls, lubricating systems, pumps, filters, water softeners, recording and indicating instruments, and mechanical controls.

Modern Methods of Dealing with

Textile Mill Modernization

By James A Austin

New England Editor, TEXTILE WORLD

This article presents the general conclusions drawn to date from the series of articles, now running in TEXTILE WORLD, in which leading mills tell what methods they have used in tackling the problem of machinery replacement. While the methods outlined for keeping a plant in modern condition are a valuable guide, all the articles bring out the thought that the will to tackle the problem is perhaps the most important thing.

THE one thought which has thus far dominated the series of TEXTILE WORLD articles on methods used by individual mills in combating wear and obsolescence is that today, perhaps more than ever before, an up-to-date plant is a prerequisite to continuing operation with a fair chance of adequate profit returns. This consideration, always a vital one, has been intensified in recent years by the increased activity on the part of machinery builders in presenting new machinery, the progress in new methods, and the highly competitive situation in the industry.

Opinion was unanimous that there has been more activity during the last ten years than in many previous decades along the lines of important improvements to existing types of machinery, actual marketing of new developments, and research work, which indicates still greater developments on the horizon. The increased willingness of the machinery builder to work with the mill in perfecting any ideas which the mill may have was also pointed out. The progress becomes all the more evident when the whole panorama of textile machinery is viewed, rather than just one branch.

The added stress on merchandising, which is apparent today, far from removing the necessity for efficient production has actually increased it. Strong pressure from the selling organization to produce wanted materials quickly, and at a competitive price, has exerted such pressure on the manufacturing unit that old methods and old machinery have proved inadequate to the task. Slim margins of profit have left no room for covering up inefficient production.

In considering the problem of obsolescence and the replacement of machinery, whether due to wear or obsolescence, much interesting data was brought to light.

No single method of keeping in touch with machinery and process developments is believed to be adequate, and no one man should do the job alone, although one man should have the major responsibility. Talks with other manufacturers, trade publications, salesmen's calls, and machinery expositions should all be utilized. As one executive phrases it, the important point is "to find out, by this means or that, what is going on in new developments and what may go on." Of equal importance are the open mind, the lack of preconceived ideas, and the willingness to investigate even though "we tried something like that before and it can't be done."

Investigating New Developments

In investigating the possibilities offered by new machinery, several important points and methods of approach have been brought out. They are:

1. *Costs:* Obviously, an accurate cost system is essential to any intelligent comparison of operating costs for old and new machinery. Accurate time studies are particularly important where a trial unit is installed.

2. *Visits to other plants:* If a unit of the machine under consideration is installed in another plant, it has been found very helpful to inspect the installation, check costs, and talk with the management and with the operatives of the machine. Incidentally, the old idea of closely guarded plants with many "secrets" has pretty well gone by the board. Most progressive executives visit other plants when the occasion arises and of course extend a like courtesy to other executives. They state that mills which are looking around for information on new machinery are the best competitors. The competition is hard, but it is found generally true that a mill which seeks modern equipment is also a mill which is

up-to-date in other lines—not the least of which are knowing costs and fighting for a fair price.

3. *Trial Units:* Installation of a trial unit is impossible in some cases and not advisable in others; but, where found feasible, the method offers an excellent opportunity to compare the operation of the machine under consideration with the old machine. The advantage of a trial unit is that operating conditions in every plant are somewhat different and data from outside sources is not always strictly applicable to an individual plant.

4. *Records of the machinery builders:* Any prejudice against the performance records of machinery builders as being unduly optimistic has largely disappeared. Builders know that the actual mill tests which they run must present the true picture, and mill men see in these records a useful mass of scientific data.

5. *Records of independent engineering concerns:* Various engineering concerns are specialists in the accurate determination of costs and plant layout. Their experience, resulting from investigations in other mills and their careful, dispassionate surveys offer valuable assistance to the mill man in the study of replacement.

6. *Repair records:* Such records should be available and should be used in the study of replacement. In addition to the actual cost of repairs, consideration should be given to the loss in production occasioned by repairs.

7. *Pioneering:* Some mills do more along the lines of developing their own ideas than do others, but it is generally agreed that no mill should hold aloof from doing a little experimentation on its own hook. Investigation of the possibility of ideas which develop within the plant goes along with investigation of outside developments.

Factors in Considering Replacement

The actual decision of whether a machine should be replaced or not is predicated on many factors, the importance of which varies considerably with different types of plant. The general factors, however, which must receive attention in any replacement program are:

1. *Quality:* Every mill executive demands that a new machine do at least as good work as the old, and he usually expects it to do better. In finishing plants and silk mills particularly, quality of work produced is one of the most important considerations.

2. *Return on investment:* With so many other factors to be taken into account, it has been found impractical to set up any hard and fast rule, even in an individual mill, for the rate of return which will justify replacement. The number of years in which a machine is expected to pay for itself varies considerably in the different branches. In some types of circular hosiery machines, where the style element is very great, the average mill man expects a return of 100% in one year on attachments, since the next season's styles may alter radically. Finishing plants usually wish a machine to pay for itself in two or three years, while the maximum is reached in certain staple mills which will consider installing machinery which will take ten years to pay for itself. Naturally, none of these figures are obligatory with so many other factors to consider, but they do represent targets. The best approach to a universal figure for the industry is found in the fact that most mill men consider five years about the maximum. In figuring the return on a machine it is again essential that costs be accurate and complete.

3. *Versatility:* Where the style factor predominates the adaptability of a certain machine for turning out different classes of work is important, since a change in style has rendered many machines obsolete, particularly in the finishing and knitting fields.

Slim margins of profit have left no room for covering up inefficient production. Competitive conditions require a sound plant as a necessary adjunct and foundation for sound managing and selling.

4. *Rebuild or replace:* Often it is a question whether the old machine should be rebuilt or a new one purchased. The only answer to this question lies in a study of the cost of rebuilding, taking into consideration lost production and similar items, a study of the results in quality and efficiency, and a check of these studies against the price and possibilities of a new machine.

5. *Accessibility and working conditions:* No machine runs forever without attention; and accessibility for oiling, cleaning, and repair work should be taken into consideration. Working conditions for the operatives on the old and new machines should also be compared.

Several side issues also arise when discussing the subject of machinery replacement. Modernization in one department may force modernization in another through the unbalancing of production. At times it is found that the real benefits of modern equipment cannot be realized in existing old buildings, and it proves an economy to erect new, modern buildings.

It has been pointed out that modernization which requires much stoppage in production or new construction can best be carried out in poor times. While it takes courage to make capital expenditures when business is bad, there are three definite benefits; namely, work can be done faster due to abundance of help and better delivery of machinery, work can be done at less expense through lower material prices, and production is slowed up when there is the least demand and not interrupted at great expense when business is rushing.

With the present activity in new machinery developments, it would seem advisable for each mill to have a definite, though flexible, routine for combating wear and obsolescence. Such a routine, predicated on the general principles brought out in this summary of articles, would include methods of maintaining equipment, methods of investigating new equipment, a clear understanding of the factors on which replacement decisions should be based, and an actual fund to purchase the replacement.

There is a natural inclination to forego the expense of modernization when profits are small or non-existent, but the series of articles brings out the fact that such restriction is economically unsound. For it has been said that a cow will continue to give milk for quite a time after you cease to feed her. But the milk gets thinner all the time—and eventually stops altogether.

Credit Experiences of 1930

Lay Background for Lessened Losses

◆ **The credit man has had more than his usual share of grief during 1930. In addition to his primary job of protecting his firm against financial loss, he has had the more human problems of extending leniency to temporarily embarrassed customers, and of resisting the impulse toward panic which would unnecessarily hamper his company's sales efforts. Mr. Dayton outlines certain fundamentals which should be observed . . . Particularly significant is the suggestion that the industry rely on promotion and merchandising for sales, not on terms and credit.—*Editor.*** ◆

Caution Urged as 1931 Keynote in Silk-Rayon Credit Extension

By Forrest S. Dayton

President, The Silk & Rayon Credit Association

CAUTION, tempered by a sympathetic understanding of customer's problems must be the rule for the first part of 1931 as regards credit extension in the silk and rayon industries. At the moment of writing, with the first quarter under way, it appears that the credit manager must be especially careful and must scrutinize the purchaser's standing with more than usual vigilance; many firms were badly hit in 1930, and some which have weathered the year have been relying upon an anticipated early improvement in 1931. If this improvement does not develop, some of these firms will find themselves in difficulty before the year is much older.

Conditions in 1930 required the credit man to pay more attention to a customer's accounting system. Even now many firms extending credit are not paying enough attention to this important factor. Credit managers who have recognized how essential is the securing of adequate information respecting their customers, have learned a great deal during the last year.

The year just passed held sad experiences for many silk houses. The general depression and the rapid decline in the silk market compelled suppliers to adjust their credits to meet quickly changing conditions. As a consequence, houses realized more than ever the importance of obtaining certified public accountants' statements and of having the accountants actually take inventory and verify the various items of the statement.

When raw silk began its rapid decline, credit grantors foresaw the necessity of determining their customer's contingent liability. As the decline grew more serious, it became quite clear that many firms would feel the pinch, as they had bought at higher levels for months ahead and began to receive deliveries only when prices were well on the way down. This presented a difficult problem, and silk manufacturers in many cases found it necessary to ask for the cooperation of raw silk suppliers. Requests were made by the manufacturer that the seller either share in the loss or extend deliveries on high-priced contracts. The manufacturer also asked that he be allowed when taking delivery to purchase additional silk at current prices. He then took in this silk together with part of previousy contracted higher-priced silk, so that he had the opportunity of averaging his price. In most cases the raw silk supplier adopted a helpful attitude in one way or another.

1931 to Be Difficult

Perhaps never have the credit man's problems in textiles been so complex as during the year just closed, and the prospects are that they will be equally difficult in 1931. The problems of the credit department would be greatly lessened if it were possible for the manager to visit his customers' mills more frequently. This would give him a more intelligent understanding of the value of the properties. Statements evaluating these items are not sufficient. Frequently they list fixed assets at appraised valuation and fail to allow sufficiently for depreciation. An occasional visit by credit managers to mills would greatly facilitate their task of estimating the customer's resources.

Due to the depression, the credit man has had to give more consideration than previously to the items of sales and inventory. This is a real gage of a firm's condition. If proper attention were given to these figures, there would doubtless have had less over-production in 1930.

In our trades it has been the custom to furnish financial statements once and, in some cases, twice a year. It has been difficult, however, to obtain profit and loss statements and credit managers should be more insistent upon obtaining this information in the future. There is a tendency toward relying more on book figures, but firms could go much further in this direction by insisting upon the information they require.

Many of the smaller manufacturers should be more conservative in the extension of credit. They will often admit that they are in no position to ask their customers for his financial statement or references. Instead the manufacturer often goes to his bank and asks if it will accept the paper of the buyer. If the bank agrees, the manufacturer is satisfied. He feels that the buyer's credit must be unquestionable. This of course, is not entirely so considered by the banker, for he is relying on the depositor's endorsement as well as the buyer's paper. During the last year, particularly the latter half, it has been interesting to note the number of firms in the industry that have entered into arrangements with two or more commission houses in order to obtain the fullest credit protection with maximum amount of sales.

While credit now calls for as much if not more serious consideration than last year, we have the advantage of a closer understanding of our accounts obtained in 1930 to profit by. One encouraging tendency is that most raw and thrown silk houses today sell on terms of 60 days. While the terms in the raw and thrown silk trade are practically uniform, in the cutting-up trade they are becoming unreasonable.

Modern methods of assembling credit data proved their true worth during the year. A service, such as that offered by The Silk & Rayon Credit Association, which enables us to know monthly what a firm is owing, has proved vital in times like these when market conditions are so variable. The results secured through membership cooperation have been most gratifying.

In the rayon industry, the 1930 depression and the silk decline had a less acute effect on credits. Rayon producers found their payments coming in more slowly than usual. There were frequent requests for extra time. Producers adopted a sympathetic attitude and were as lenient as possible, compatible with their own protection. These suppliers found their chief credit problem among those hosiery mills which were not adequately financed; the financial position of these knitters was good enough for fair weather times, but in many cases it was necessary for local banks to carry them. This applied particularly to smaller hosiery mills in the South, where the depression cut into sales and naturally had an adverse effect on credit standing. Rayon underwear knitters have apparently survived the year in satisfactory condition and little trouble was experienced by credit managers in this field, due to the fact that today most of this business is handled by a few large firms.

Rayon credit managers favor 30-day terms, as it has been found that producers having longer terms have proportionately larger losses.

Asked for what they felt would be a most helpful suggestion for 1931, certain rayon credit managers gave this answer, and it might serve as a general 1931 credit message for the entire group:

"Let the textile yarn industry rely on promotion and merchandising for sales, not on terms and credit. Terms and credit have been offered as an inducement for sales, and we strongly feel this is a tendency which should be corrected, as it can only be unprofitable in the long run. Competition for sales should be based on quality and price—and these only."

Wool-Cotton Credit Outlook Clearer After Trying Year

By Warren C. Steele

Assistant Editor, TEXTILE WORLD

FAILURES among manufacturers of men's clothing during 1930 were proportionately larger than in any other section of the industry. Statistics prepared by the National Credit Office, New York, show that during the first nine months of the year the percentage increase of insolvencies in men's clothing trade was 188%, the second largest gain, according to this data, being found in the silk field which followed with 84%.

During the first nine months 98 insolvencies were reported in the men's clothing group against only 34 during the same period in 1929 and 53 in 1928. These figures show that the last year was a strikingly difficult one for the clothing trade. They also give an excellent idea of credit conditions that manufacturers of woolen and worsted goods have been faced, and most sellers agree that 1930 was one of the most difficult years they have ever experienced as regards keeping credit losses at a minimum.

Liabilities of men's clothing concerns that failed during the first nine months of the year increased 245% over the same period in the preceding year, this percentage again being the largest in any group in textile field covered by the survey. Failures in this branch totaled $6,492,000 during the period and indicated a total of more than $7,000,000 for the year 1930. Failures in first nine months of 1929 amounted only to $1,880,000.

The one bright spot in the men's clothing situation during the year was that the number of insolvencies decreased toward the end of the year, the largest number occurring in the first quarter, less in the second and the third giving the smallest total of the period. Indications point to the last quarter as being no worse than the third.

In comparison with men's clothing, manufacturers of women's coats and suits presented a much better picture; the increase in the first nine months of 1930 in number of insolvencies was 80% over the same period in the previous year. Liabilities of coat and suit failures were 124% larger during the first nine months, than in 1929.

Manufacturers of cotton goods, although facing a serious condition with respect to credits, presented a better risk than in the woolen and worsted fields. The number of insolvencies increased 71% as compared with the previous year, according to data covering first nine months. Liabilities of these firms increased 148% over 1929. In the cotton industry the trend has been opposite to that in the wool trade, failures having tended to increase toward the end of the year.

The entire picture indicates that while drastic conditions in these trades have resulted in an unusually large number of insolvencies, wool and cotton trades believe that the worst is over. The industries are reasonably confident that credit conditions this year will be better.

For many cotton mills the purchase of long - drafting equipment for spinning would prove more profitable than any other equal investment

Better Management Brings Reduction of Cotton Manufacturing Costs

By C. S. Tatum

Manager, Pilot Division, Consolidated Textile Corp., Raleigh, N. C.

IN COTTON manufacturing the greatest advances of the last year seem to have come, not in the installation of new equipment, but in the better management of the old. Because of unfavorable conditions in the industry, it has been necessary for all mills to operate as economically as possible. In order to reduce the manufacturing cost per pound, each operative must tend more machines than formerly. It is therefore imperative that each machine be kept in the best of repair, and that every effort be made to produce cleaner, stronger, and more even yarn. Increased use of intelligent surveys and inauguration of regular inspection systems necessary to bring about these results have been a great forward step.

Oil Spraying

While there have been few important improvements introduced into the opening rooms, one exception is that a great many mills have installed systems for spraying their cotton with oil. In the case of mills doing raw-stock dyeing, there has been some progress made in the matter of putting in preparatory cleaning machines, so that the cotton is opened and cleaned before it is dyed. This practice gives more even dyeing and saves dyestuff.

In the picker room there have been a comparatively large number of installations of equipment for single-process picking. In fact, the number is surprisingly large, considering the financial condition of the industry. This would seem to be convincing proof that single-process picking has proved to be all that had been anticipated for it in the beginning. In addition to enabling a considerable saving in labor, the single-process pickers have lived up to their reputation for producing more even laps.

The outstanding improvement introduced on pickers this year is the automatic doffing device. This development is so very new that it is hard to say at this time just how popular it will prove to be, but it appears to have a number of good features aside from labor saving.

Continued refinement has been made in instruments for determining and making allowances for variation in moisture in finisher laps. This is an important factor in the regulation of weights, and one which until recently had been neglected by many mills.

Newer types of card clothing have continued to hold the interest of the entire cotton textile industry, and considerable progress has been made in the introduction of the various types of new clothing which reduce card

stripping to a minimum, and which therefore give a more even sliver and save many thousand pounds of cotton. There has also been some progress made in the installation of various types of card strippers; the continuous stripping roll has monopolized most of the attention in this field.

A marked tendency was shown during 1930 to get away from the old method of drafting, both in carding and spinning. This is seen in the change that is being made in the types of top rolls, a trend being to employ such materials as cork, wood, and rubber. The wooden roll has proved successful its own particular field.

Long-Draft Spinning

Very probably more money has been spent for long-draft-spinning equipment this year than has been invested in any other improvement. In a great many instances greater reduction in manufacturing costs can be realized from money expended for long-draft equipment than can be obtained by any other equal investment.

Few changes have been made in high-speed spoolers, winders, and warpers. This is not surprising when it is considered how nearly perfect some of these were when they were first brought out. Naturally there were not a large number of installations of these very expensive machines last year.

Operating executives are showing more than the usual amount of interest in trying to make improvements in cleaning methods. That is, they are trying to discover methods of cleaning machinery without getting the fly and lint into the yarns and cloth.

More and more interest has been shown in the installation of temperature controls and recorders for size kettles, size boxes, and slasher cylinders. There has been real progress made in the development of control instruments, and mills are gradually becoming better educated to a realization of the importance of temperature control in the warp-sizing process. Many mill men have recognized the folly of drying warps bone dry on the slasher and attempting to recondition them by means of humidifying systems in the weave room, only to find it impossible to bring the yarn back to its normal condition. In the old hit-or-miss fashion of hand regulation, the yarn was too dry or too damp most of the time. It is becoming understood by more and more mills that it is far better to leave a normal amount of moisture in the yarn in the first place.

Loom builders are continuing to refine their looms, eliminating unnecessary parts, simplifying the construction so as to make the parts more accessible to loom-fixers; standardizing bolts and nuts so that the fixers will not be required to carry so many wrenches with them, and improving the mechanical stop motions.

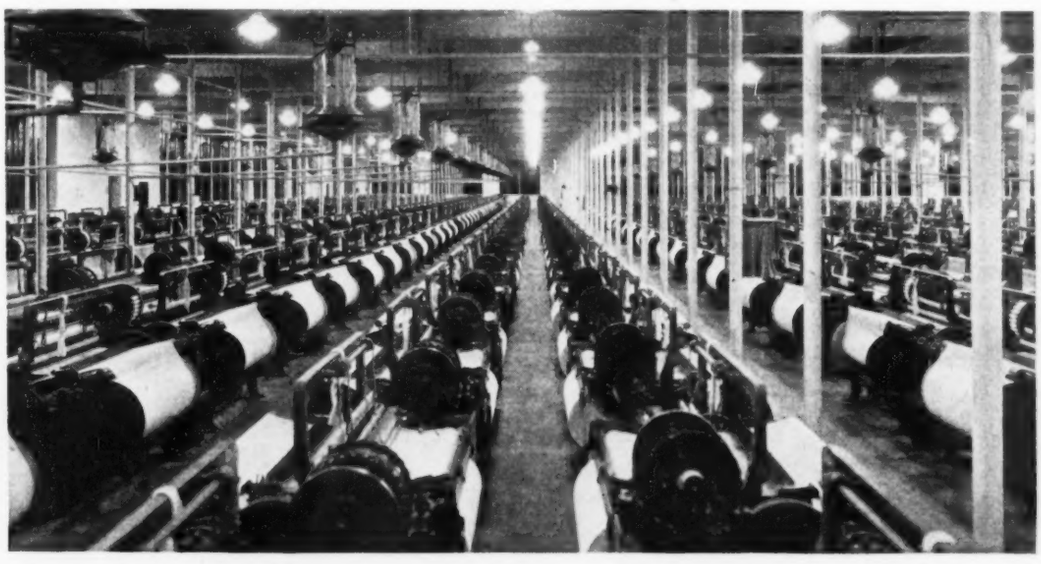
Improvements in Looms

A daring venture in the loom-building field noted recently is the new cotton shuttle-changing loom. This model completes the transfer without checking the speed of the loom, and is said to have other advantages.

In the cloth rooms more attention is being paid to putting up goods in attractive packages, with all loose threads removed. Improved equipment is being installed from time to time for shearing off the threads, and this permits a better-appearing piece of goods and a neater package. There have also been some improvements made in the baling process. In some instances cardboard cases are being substituted. This is an advantage to shipper as well as merchant, since a neater package is obtained and one that protects the goods better.

One manufacturer has put on the market a new type of humidifier designed primarily for rooms with low ceilings, and especially suited for dirty rooms.

In endeavoring to read the signs of the times, we should say 1931 will be, on the whole, a much more profitable year to the mills than has 1930. During the second half of the year, considerable money will be spent for new equipment, mostly for the various improvements already mentioned. Opener-room equipment should be made as nearly fireproof as possible by substituting bronze and other metals for iron, so as to remove chances for sparks. Automatic feeders for breaker-picker hoppers should be perfected, so that an even amount of cotton can be had in all hoppers at all times. Positively driven aprons on all pickers and improved evener motions are also needed. In fact, the tendency will be to get more and more even laps, thus eliminating the necessity for so many doublings in the card room and making it easier to cut out processes and lengthen drafts. The tendency will be to extend the long-drafting system to the card room, and in order to do this to best advantage everything possible must be done to start an even lap through the card. When this is accomplished, and not until then, will it be practical to cut down on doublings to any great extent.



Loom construction has been simplified by elimination of unnecessary parts

Domination of American Cotton Threatened

by Gain in Volume and Quality of Foreign Cottons

By Alston H. Garside
Economist of the New York Cotton Exchange

ONE of the facts which the cotton trade has come to recognize much more clearly during the last two or three years than previously is that American cotton does not hold absolute sway in the cotton markets of the world. Those who believed that this country has a natural monopoly in supplying the world with its chief textile raw material have been rudely awakened. They have found that the domain of King Cotton is not by any means confined to that area which lies south of the Mason and Dixon line but it includes at least as much more of the earth's surface, spread over three score of countries in every quarter of the globe.

There has not come about suddenly a great and revolutionary change in the world cotton trade, by which the relative positions of American and foreign cottons have been fundamentally altered over-night. This could hardly happen in one of the world's greatest industries. What has happened has been a marked acceleration of a trend which has been in progress for at least two or three decades, and which has finally produced a situation which commands attention from a commercial, as well as a broad economic, viewpoint. Production of foreign cotton has been increasing much more rapidly than production of American cotton for over 20 years. It has been only recently, however, when foreign growths have reached a volume where spinners have come to use nearly as much of them as they use of American cotton, and when the price competition of foreign cottons has become all too evident, that members of the trade have given this subject the consideration which it has deserved.

Any effort to measure the extent to which foreign cottons have tended to outstrip American at once meets the complication that production in individual countries, as well as in the world as a whole, fluctuates from year to year as a result of variations in growing conditions, and, consequently, changes in the relative sizes of single crops cannot be taken as indicative of long-term trends. Neither can changes in the relative consumption of the various growths of cotton from year to year be taken as showing fundamental trends, since a large crop of a given kind of cotton necessarily results in a relatively low price for that growth, which moves the temporarily enlarged supply of it into consumption.

The only way in which long-term trends can be discovered, and measured with any approach to accuracy, is by taking averages for production or consumption in successive groups of years. It may be assumed that, say, over five-year periods, variations in growing conditions approximately balance, and hence changes from the average for one quinquennial to the average for a later quinquennial have a significance. The greater expansion in foreign cottons than in American cannot be measured by figures on relative acreages, partly because acreage figures for some countries are not available or are unreliable, but principally because the United States has lost ground, relative to other countries, much more on account of reduced yields per acre than through failure to increase its acreage as rapidly as foreign countries.

Strides Made in Foreign Cottons

Here are what the statistical records show: In the five years from 1909 to 1913 inclusive the United States produced an average of 13,143,000 bales per year, and in the five years from 1926 to 1930 inclusive it produced an average of 14,934,000 bales per year; the increase was 1,791,000 bales or 14%. Foreign countries on the other hand produced an average of 7,713,000 bales per

year in 1909 to 1913, but from 1926 to 1930 they made an average of 11,111,000 per year; the increase for foreign countries was thus 3,398,000 bales or 44%. If one should take as a basis the averages for the last four years instead of the last five years—thereby omitting from the calculation the big American crop in 1926—and compare this with the average for the pre-war period, one would arrive at even more startling results. In these last four years, 1927 to 1930 inclusive, the United States has produced an average per year of only 14,127,000 bales, representing an increase over the 1909 to 1913 average of only 984,000 bales or 7%, while foreign countries have produced an average of 11,463,000 bales per year, representing an increase over the pre-war average of 3,750,000 bales or 49%. Accordingly, it is clear that production of cotton abroad in the last 20 years has increased at a much more rapid rate—three times as fast when measured on one basis and seven times as fast according to the other method of calculation—than production of American cotton.

It is highly important to note, in considering these figures of relative growth in the last two decades, that the greater portion of the world cotton crop is still made in the United States. In the last five years, the American crops have constituted an average of 57%, and in the last four years an average of 55%, of the world's total growth. In the five years before the World War, the American crops constituted an average of 63% of the world crops. It may be surprising, at first thought, to find that the percentage represented by the American crop in the world's total production has dropped only from 63 to 57 or 55 since pre-war years, notwithstanding the much more rapid percentage increase in production abroad than in the United States. American cotton still dominates the world cotton trade in the sense that, constituting a much larger share of the world supply than all other crops put together, it has the greatest single influence in the determination of world cotton price levels.

But the fact still remains that the curve of production for foreign countries in the aggregate is much more sharply upward than that for the United States, and it is obvious that the United States will not hold its dominating position in cotton many years if the present trend continues. Trends in industry, based on fundamental factors, have a way of growing in speed and force as the years pass, and there are reasons to expect that this may hold true in the realm of cotton production. The establishment and development of cotton-growing in new areas meet great obstacles, such as the lack of trained labor, absence of transportation facilities, and inexperience as to the best kinds of cotton to be grown and the best agricultural methods to be employed in the new fields. Merchants and spinners have to become familiar with a new growth, and spinners have to become convinced that there will be a continuing supply before they will experiment with it. Once such difficulties as these are overcome, expansion in production is at an increasing rate. The United States will undoubtedly grow more cotton than any other one country for very many years to come—India, the second country in cotton production, makes less than one-third as much as this country on an average — but, if the present trend is continued, only a few years will be required to put total foreign production on a level with production in this country.

There is no disputing the fact that foreign cottons have a great influence in determining the price level of cotton in general, including American cotton. Liverpool is the greatest meeting point in the world for the various growths of cotton, and any merchant in that market will agree that American, Indian, Egyptian, Brazilian, Peruvian, Argentine, Russian, and the various African growths compete keenly with each other. It is not true, of course, that all of these cottons are interchangeable for the same uses, any more than long staple and short staple American cottons are interchangeable. They vary greatly in staple length, strength, smoothness, grade, and in the other characteristics which determine spinning value and availability for specific uses. But manufacturers have found it possible to substitute certain kinds of cotton for certain other kinds for many of the yarns and cloths which they produce, and distributors and users of goods have found that, for many purposes, they can change the kinds of goods which they purchase in ways which result in mills using different kinds of cotton.

American and Foreign Near Parity

The opportunities for substituting certain kinds of foreign cotton for certain kinds of American have been greatly increased in recent years by improvement in the quality of some foreign cottons and deterioration in American cotton, which changes have tended to put American and foreign growths more nearly on a par from the standpoint of spinning quality. Probably as much as half of the total amount of cotton grown in foreign countries compares favorably with American cotton in staple length. Possibilities of substitution are certainly large enough to enable spinners of the world to change from American cotton to foreign cotton or vice versa to the extent of several million bales.

In view of these facts, it is not surprising that those who are interested in American cotton are following foreign cotton developments more closely than ever before. Merchants and spinners find that it is of prime importance to keep informed as to production, consumption and stocks of foreign growths, if they would understand the movement of prices of the American staple. With cotton the second largest of all domestic crops, and over half of it exported, the increasing competition of foreign growths is a matter of vital concern in framing national economic policies.

Modernized Woolen Mills

Will Capitalize on Their Investments

By Stanley H. Wheelock

President, Stanley Woolen Co., Uxbridge, Mass.

MILLS which have met the new and varied merchandising problems and have also kept in step with the latest manufacturing developments are in a splendid position to capitalize upon their new investments as the day for greater confidence and better business surely but slowly approaches. The trend of business in the immediate future all points to a return of the sound old principles of sanity and caution. The speculative idea is vanishing in thin air. In place of guesswork, manufacturers are more and more depending upon organization reports of facts, and with this information at hand they proceed with their manufacturing in an intelligent manner. Costs are studied as never before, figureheads are discharged, and new ideas and principles are given careful attention.

The policy of studying the individual customer's needs and requirements is gaining favor, and several manufacturers are doing over 50% of their total business with three or four large clothiers. This all means less work for the middleman or sales agent to do, and in certain cases a gradual elimination of his services.

Now as to machinery, most of the successful mills have long ago discarded the small cards with their wooden cylinders and 9-in. doffers and have installed the modern 60-in. cards with iron cylinders and tape condensers or the recently improved 20-in. cards.

A new attachment has recently been placed upon the market whereby slubs for novelty yarns can be made during the original carding, placed any desired distance apart in the roving, without harm to the doffers or the card clothing. This makes a much more simple and less expensive arrangement for producing slub effects than the old method of dropping them into the card with a nub machine, giving an irregular and scattered effect.

Mules have in many cases given way to frames in the spinning department; and where this has not been done, new mules have been purchased which are much faster and more efficient than the old ones and which, on certain kinds of work, compare very favorably with the new spinning frames.

One of the most recent strides has come in the weaving department with the development of the new high-speed automatic loom. This loom is primarily intended for worsted work but may also be used on special types of woolen work where the yarn will stand an unusual strain. The new loom has proved to have a practical speed range of 130 to 160 picks per minute, depending upon the type of fabric and size of yarns—a 10 to 30% improvement. When coupled with the added feature of weaving pick and pick, now being tested, in place of two picks from each shuttle, this loom will stand in a class by itself.

In the finishing department great strides have already taken place during the last year. The improvements in fulling mills and washing machines are all well known by alert manufacturers. The impossible of tradition in fulling has been accomplished, and we now enjoy not only much greater production but also more uniform and quicker felting than ever before. One further improvement in fulling mills may be the installation of some heating device to turn on during cold mornings when, owing to extreme conditions in northern climates, it requires an unusual time for the mill to warm up and the process of felting to begin.

Another development which may be further perfected and utilized in the near future by mills working on piece dyes is the combination washing and dyeing machine. This is now used by comparatively few mills, but it saves both the time and labor of unloading and reloading the same goods preparatory to dyeing. Greater speed in cloth drying has reduced costs, and the same may be said of modern shearing.

It may be of interest to know that in Massachusetts the Industrial Commission, created under a resolve of the Legislature of 1929, in its report just filed states that during the last five years about one third of the mills in Massachusetts have increased their productive capacity through the installation of new machinery or plant facilities. Of the 26 mills reporting new equipment, 16 were included in the 30 concerns which operated at better than 60% of capacity in the first half of 1930, constituting 53% of this group. Eighty per cent of the mills which operated below 60% of capacity in the first half of 1930 indicated no changes in equipment during the last five years.

Westinghouse photo.

Important improvements have been made in woolen spinning machinery

Increasing Demand for Fine Worsted Counts

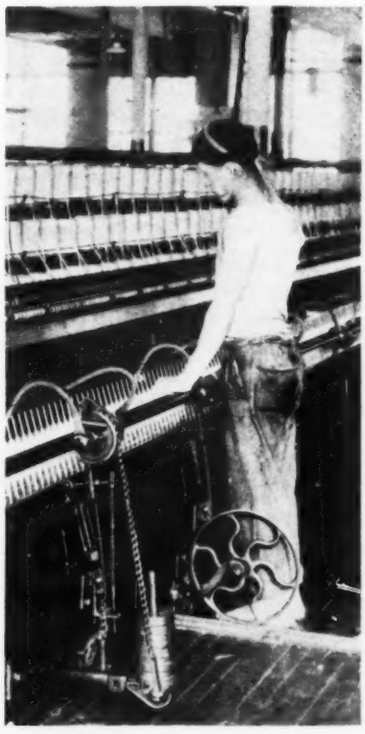
Calls for More Accurate Spinning

By S. Kershaw, F. T. I.

WOOL prices are low, but not likely to go to lower. While we remember that many farmers are mutton producers first and wool growers second, we must not forget that our finest wools are grown under conditions and by sheep which do not allow any supplementary income from mutton. Wool growers are coming to recognize forcefully that at the present low rates speculative buying is taking place and that, when trade is better and a healthier demand for wool appears, some of it now bought will be sent to the sales rooms and re-offered. This will result in postponing the date of increased values. They have therefore now issued a fiat: The offerings in wool-growing countries are to be curtailed and wool is to be sold over longer periods in order to stop this cheap forward buying.

The present time is notable for its slow, painstaking, and costly research on the one hand, and for its antithesis, the ready sales of showy, flimsy, and often short-lived fabrics on the other. Scientists are seeking to discover every virtue in all materials in order to obtain their utmost use and value; and yet the age demands change, novelty, and attraction, rather than durability. While scientists labor to learn how to improve the wool fiber, the manufacturers may be more concerned with the art of limiting its use and wearing properties, in order to secure quicker repeat orders. This is quite the case in certain instances, though it smacks of dishonesty.

We have previously called the attention of TEXTILE WORLD readers to the Duhamel system for wool scouring. Great interest is being taken in the experiments carried out by the pioneer firm in England, and several wool combers are satisfied that this method is the most natural and economical. The lanolin product taken from the effluent is remarkably pure.



Some of the finest and roundest yarns are being made from short wools on the French system

The necessity for producing clear worsted tops grows in importance year by year in proportion to the decrease in the weight of the cloths that are fashionable; because, as the yarn is spun finer, any neps present appear larger. A nep on a 24s yarn may look like a grub on a branch, but on a 60s yarn it will look like a crow by comparison. Several comber inventors are devoting time and attention to this matter, but as yet nothing of permanent value has appeared. The work must continue, for neps in wool make wool goods look like cotton; and buyers, seeing them, value them at cotton prices.

Worsted spinners must redouble their efforts in trying to make wool spin up instead of down. Thick counts will be required, but at the present the demand for moderately fine counts is increasing, accompanied by a demand for very fine counts also. The busiest spinners in England at the present are those engaged in fine work, such at 1/80s to 1/100s for paramattas, taffetas, imperials, cashmeres, delaines, etc. This work is very exacting, and there must be no hit-or-miss methods. It may be said to depend more upon men than machines, for we have known firms with old machinery to make these yarns successfully, and others with new machinery not to be able to compete. It calls for the right choice of material, processed from the commencement and at every stage by correct methods.

The present vogue is for fine counts with hard twists for crêpe effects to follow the recent suede crêpes made from rayon. The hard-twisted rayon is now being replaced with hard-twisted botany yarns, spun to very fine counts. Every care will have to be exercised by spinners in gaining absolute uniformity of yarn diameter, in order that the twist may not further aggravate the trouble by making thin places in the yarn look decidedly thinner.

Some of the finest and roundest yarns manufactured in the worsted industry are made from short wools. The latter, processed on the French or Continental system, receive more complete fiber control than longer and more promising wools on the English system. Much depends upon the skill of the processor. From the gill box to the spinning frame the slivers and slubbings should be examined and any unevenness prevented. Without this care "luxury" yarns wanted for crêpes, etc., cannot be made.

It is somewhat ironical that while fine yarns are being spun in left and right twists to be arranged in the warp to give variable shrinking effects, this same effect is a fault when mohair and wool are blended. The use of mohair has diminished during recent years, and some new uses will have to be devised for it. Rayon competition in lining manufacture has been keenly felt, and at present rayon linings are in a strong position. If mohair could be sold at wool prices, there would be an immediate recovery.

Experiments have recently been conducted at Bradford to make wool rags, defibered, carded, and combed, into worsted yarns and cloths. This stands as a technical achievement, but the material is not worth all the expense necessary for converting it into yarn.

Woolen and Worsted Weaving of Future

By Robert A. C. Scott

"We have not reached the end of long chain of improvements"

BEFORE seeking to study the future, it is well to cast at least a hurried glance at the past. According to historical data, the manufacture of woolens originated in the colder parts of Northern Europe, England and Flanders, around the year 956. Little or no progress, from a mechanical standpoint, was made until the year 1733, when John Kay invented the flying shuttle. Seventy-one years later (1804) the jacquard loom made its bow.

From then on progress in the art was rapid; and subsequent to this period the most important invention undoubtedly was the treadle loom, which, as the name implies, has a pedal arrangement for raising and lowering the harness. Following this came the "witch" or "dobby" loom, which, owing to its automatic head motion and single-treadle arrangement, soon superseded the former type of loom. A new era was begun in 1787 when Dr. Cartwright invented the first power loom.

As the years rolled on, the need for greater speed and efficiency became evident, resulting in every conceivable mechanical invention in furtherance of this project. In reviewing these various improvements, the following may be mentioned as constituting the most beneficial and outstanding inventions: (1) filling and warp stop motions; (2) positive let-off and take-up motions; (3) four six-box looms, allowing for fancy filling pattern effects; (4) larger harness capacity; (5) higher speeds in operation; (6) double-lift selvage jacquard; (7) automatic shuttle changing; (8) reversing motion; and (9) the automatic loom, of which the most recent worsted type claims a speed of 150 to 160 picks per minute, representing roughly a 60% increase during the past decade.

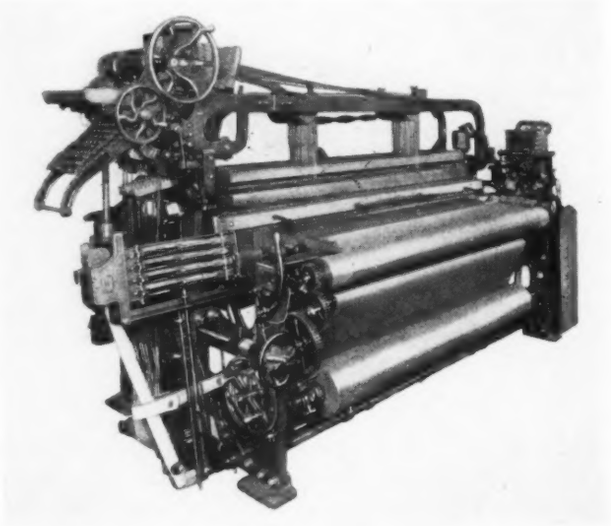
We may well marvel at the rapid progress made in the development of weaving during the past century; but notwithstanding all these astounding contrivances and the progress made, it cannot be truthfully said that we have reached the highest point of perfection.

Although the automatic loom has given us almost unbelievable results in speeding up production in the plainer class of goods, progress in the fancy field of woven fabrics has been negligible. Without over-exerting our powers of imagination, it is safe to predict for the very near future the successful development of an automatic loom with a probable speed of 150 to 160 picks per minute, adaptable for pick-and-pick shuttling. To forecast the mechanical picking arrangement of such a machine would be nothing short of conjecture, but from an interested enthusiast's viewpoint it seems feasible to anticipate a substitution of the drop-box motion by the circular (vertical) motion, which is considered very satisfactory for rapidly running looms.

The American box loom of the future will in all likelihood be equipped with a "crammed filling motion"; i.e., an automatic arrangement working in conjunction with the box chain, which on certain picks temporarily disengages the let-off and take-up gears, thereby cramming or crowding the pick or picks desired. This allows of the manufacture of what is commonly known as "hung-on backs" (a single cloth with a fancy skeleton plaid on the back which does not show on the face). I understand that English looms are equipped with motions of this nature. We may therefore anticipate an early appearance of an American loom featuring this long overdue and much-needed mechanical motion.

Due to the reciprocating motion of the present-day loom, entailing excessive shock, vibration, and wear, it is difficult to conceive of much greater speed being attained by this type of machine. Our chief hope in this direction I firmly believe centers on the "circular loom," which, owing to its rotatory motion, permits of higher speed and at the same time eliminates excessive vibration and wear. Two machines of this description have created interest recently. One, known as the "Jabouley" loom, is an English development. The other is the invention of Robert G. Clark, of Brooklyn, N. Y.

These inventions, although in their infancy, promise changes of a revolutionary character and may materially affect future methods of manufacture. A few of the advantages claimed for this type of loom are less floor space per unit, reduced vibration and wear, larger scope for designs, and much higher speeds. A thorough understanding of the mechanical construction of this machine is not necessary to enable us fully to realize and appreciate its almost uncanny possibilities. It might be truthfully said that the ingenuity of man is not subject to limitations and that what we consider fantastic and beyond human accomplishment today may become a reality tomorrow.



Modern high-speed worsted loom

Wool Marketing Corporation Has Made Good Start

Interview by Warren C. Steele with

Charles F. H. Johnson

President, Botany Worsted Mills

TO EVALUATE the results of the activities of the National Wool Marketing Corp. in its first year of operation, is a somewhat difficult task and one that is likely to be controversial. There is ignorance on the part of both the growers themselves and also on the part of the dealers and manufacturers of the actual good that the Federal Farm Board has accomplished through the wool marketing corporation and its cooperatives, without much blare of trumpets or beating of drums.

There is no question that a large part of the much hoped for stability in the woolen and worsted industry is dependent upon a stabilized raw material market. A year ago, the world markets had dropped severely, and we, in turn, were down to a basis that was still lower than world prices, taking into consideration the duty. There was a wool surplus in this country which was a decidedly disturbing factor, because while there were cooperatives and independents and all sorts of marketing, there never was any certainty as to when someone needing money would bust the market with an odd lot and then yarn prices would wabble, goods prices would be unstable, cutters and retailers would hesitate, and the net result was disorder and uncertainty.

Then the National Wool Marketing Corp. was formed. The work of those who have been actively in control of its operations has been most intelligently directed to the point where much of the difficulty, that would have been accentuated as the year went along, was checked. Conditions were made far easier than they would have been under the old state of affairs. With a market dropping still more throughout the world, the American grower would have been in no position to do otherwise than dump everything that he had or go broke, probably both. The effect of that upon dealers and manufacturers would have been quite disastrous, in my judgment.

The work of the marketing organization has not been a simple matter. As a nation, we are individualists. It is only the very poor who are good cooperators or who understand real cooperation, and poverty has not hit us, since our early days as Americans, sufficiently to make us understand the true collective ability that was then so well stated in "united we stand, divided we fall." In the wool section, whether through poverty or awakening of understanding, there has been a getting-together, a better understanding, a mutual cooperation, or, to use an expression, "the talking of one language," which has been of great value and should be of even greater value in the future.

The American wool grower is beginning to realize that distribution of his product is as important as the growing of it, even more so. He is also realizing that his one market is the American manufacturer; he has no other. The American manufacturer has been brought in closer contact with the grower to the point where he realizes that many benefits can come back to him through his encouragement and support of the grower. If he will tell his problems to the grower, collectively, through the National Wool Marketing Corp., many ills can be corrected.

I would summarize the accomplishments of the National Wool Marketing Corp. in its less than a year's time, as follows:

1. It has increased the amount of wool handled cooperatively from a few million pounds to 111,000,000 or about 38% of the domestic clip; 85% of the domestic mohair clip is now handled cooperatively as against a negligible percentage formerly so handled.

2. It has helped a complicated, depressed textile manufacturing situation.

3. The American wool grower has been more than twice as well off as the grower in any other country in respect to a comparison of his cost of production and current wool values obtaining in his market. The tariff *plus* the *stabilizing* influence of the National Wool Marketing Corp. has made this possible.

4. The solid business principles upon which the National Wool Marketing Corp. is founded have in one short year so gained the confidence of the wool growers that indications at this time are that between 40 and 50% of the wool produced in the United States for 1931 will be cooperatively handled.

The wool grower and the manufacturer are being brought to a realization of the value of joint approach and understanding of each other's problems and their ability to be of greater service to each other by approaching the curtailment of production intelligently. More orderly growing of wool, rather than the present indiscriminate production, will thereby ensue. A closer relationship between these two groups and the Department of Agriculture will be helpful in eliminating much that is inefficient in the wool growers' production. All such getting together has a tendency toward stabilizing the industry, and in this and in much other progressive effort, the National Wool Marketing Corp., the cooperatives through whom it works and its officers, are showing the way.

Exacting Requirements

Transform Throwster

into Fine Technician

By Henry W. Schliske

Read & Lovatt Mfg. Co., New York

TWENTY-FIVE years ago there were few grades of raw silk from Japan. There were possibly two from Italy (Extra Classical and Classical), a sprinkling of some high-class Chinas, and a little French. The writer remembers getting a bale or two of Broussa, a Syrian silk, reeled or rereeled in Italy. At that time most of the raw silk prepared for throwing was soaked the same, regardless of the purpose for which it was intended. Most all of the material thrown was delivered in skeins to the dyer and colored in that form, and the extent of the weighting done in those days was about 30% at the most.

Crepe was just an infant in arms, and few throwing concerns in this country cared to touch it. Piece dyeing was of course done in a small way on silk and silk mixed goods, but the silk piece goods were dyed and finished generally without any attempt at weighting.

Hosiery made from silk at that time was indeed a rarity and a luxury. The majority of concerns in this country manufacturing hosiery at that time had their silk skein dyed, making the ingrain stocking. Naturally, the rapid growth of hosiery as an industry had a marked effect on raw-silk reeling in Japan and in other silk producing countries, for it was found that hosiery required a silk of more standard evenness and cleanness than was at that time obtainable. A profusion of gradings came into being, necessitating that the manufacturers, whether weavers or knitters, secure the cooperation of the throwster to guard against the use of any silk which was not suitable or up to grade.

From that time on, it became increasingly important that the throwster be "laboratory minded." In order to meet the demands of his customers, he was obliged to study and devise evenness and cleanness standards and to check up more closely and constantly on variations in size of the raw silk. As the hosiery industry developed into the stage where stockings were dip-dyed, the question of proper soaking and treating of silk became vastly more important.

The growth of the industry has necessitated the throwster becoming a technician of high order, keeping pace with the progress and demand of a very exacting business. Years ago it was unnecessary for him to be called in to decide on a defect that might appear in his customer's merchandise, but now-a-days it seems he must be somewhat of an expert in raw silk, throwing, weaving, knitting, dyeing, and finishing in order to render the high type of service and cooperation expected of him.

The throwster of today must therefore keep abreast of the times by the installation and maintenance of modern machinery and laboratory equipment. It will be found, and the time is coming soon, that only the throwster so equipped will be given consideration by discerning manufacturers requiring a high type of service and willing to pay a proportionately fair throwing price. It is to be regretted that competition in the last year has been of such a nature as to force average throwing prices below a level in keeping with honest endeavor and effort. It is to be hoped that manufacturers, as a whole, will regard the throwster as typifying service, and surely the throwster who is equipped to render a high type of service is deserving of a fair throwing price.

Preparation for Improved Trade

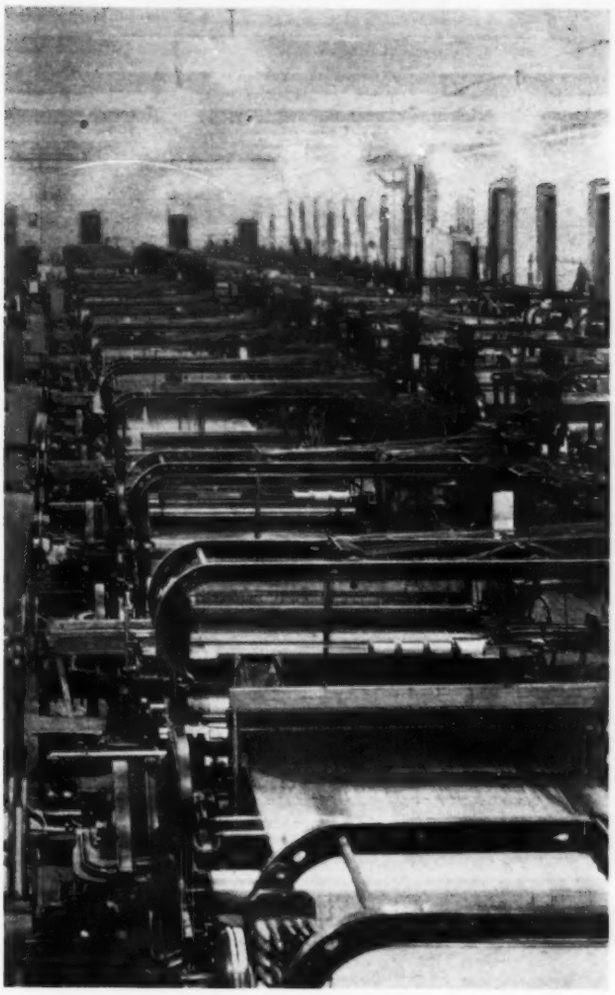
Most of us are finding a great deal of comfort in the fact that the year 1930 has at last passed by. While we feel that a dull year is to be more or less expected every once in so often, we should all be prepared not only to meet depressed conditions with optimism, but also with a certain readiness to fit ourselves for better things to come. This can best be done by continued laboratory research and plant improvements. It would not be wise to assume that the new year will see a rapid recovery in business; nevertheless, even this early in the new year, there is a strong feeling that a slow and steady improvement in general business is current.

Only the throwster equipped with modern machinery can hope to attain a fair margin of profit

Silk Weavers Must Have Courage to

Renovate Plants

By H. E. Wenrich



Modern looms permit the weaving of quality fabrics at low cost

THE year 1930 will undoubtedly be remembered by many silk manufacturers as a season of worries and headaches brought on by the depression and the resulting confusion which the silk trade experienced. Some of the largest manufacturers with their backs to the wall were forced to surrender to the attack of low-priced silk and to that more formidable opponent, obsolete machinery.

A few mills running during the depression could be thankful that the heads of their organizations had realized beforehand that their equipment was their living, and that a firm's reputation is no better than the machinery behind it. These few weavers were keeping in step with the demand for perfectly woven silks, and their plants were speaking for themselves. Profits could be made, not by the purchase of raw silk, but by the low cost of weaving the material.

Many New Looms

Loom manufacturers have made many radical improvements during the last few years, and especially during the year, in which many new looms have been placed on the market and numerous improved attachments which can be applied to looms already in operation have been brought out. In this list of attachments are a new reed holder for silk looms, which can be adjusted for either the loose or fixed reed; a new friction clutch, which prevents end thrust; and an improved take-up drive. Helical gears are now standard equipment on some looms. New ball-bearing whiproll poppets and a new warp let-off have proved their worth. In an ingenious new arrangement the harness itself acts as the drop wire in stopping the loom when an end breaks out, giving the weaver a clear vision at all times in the back of his warp.

Jabbing, bruising, and cutting of silk filling by feeler points is eliminated by a new feeler device, which consists of a spring in the shuttle spindle. When the filling runs down, the spring contacts through the shuttle with plates built into the box swell.

Machinery fifteen or more years old should be junked. Looms from five to ten years old can be placed in such shape as to compete successfully with new looms. The adoption of improved machinery parts may transform the plant into a profit maker. If a new warp let-off and whip-roll poppets are placed on those looms built several years ago, barré will be entirely eliminated. Stickers can be eliminated by a special device.

Other Improvements

Roller bearings and one-shot lubrication system will afford easier running at lower power cost. A filling-detecting device preventing broken picks and double picks, along with the shires they make, will appreciably reduce the number of seconds. Rubber on take-up drums will abolish stars and afford easier setting. Interchangeable bottom rolls allow pieces to be taken off while the looms are in operation. All these improvements point the way to profits.

The textile manufacturer is on the threshold of a new era at last, and radical changes must be made now to prepare for it. To keep a share of the business the aggressive silk weaver must have courage to rebuild thoroughly his machinery and plant.

There are several advantages in conducting modernization work in slack times. In the first place, the absence of crowded production schedules makes interference less troublesome. In the second place, the prices of new machines are likely to be lower than in busy times and orders can be filled by the machinery builders more promptly.

Foundation Being Built Under Raw Silk

By William A. Spafford

Control by Japanese government was unable to prevent raw silk plunge to record lows during the crop season, but the low prices spurred silk consumption in the United States in the four final months of 1930 to a record extent despite the "business depression."

CONSIDERATION of current conditions in, and the 1931 prospects of the raw silk market hinge to a degree on developments in Japan. The fundamental fallacy in the proposition that Governments can dictate the prices for basic commodities was well brought out in the bitter experience of Japan during 1930. We can easily understand that it was politics rather than a deep-seated faith in the ability of the hastily formed syndicate to peg prices permanently, which prompted the decision early in the year, to support the market. Yet the attempt was made to hold the market at 1250 Yen which would be the equivalent of about $5 per lb. here for the basic Saiyu grade.

The drastic deflation that followed the removal of Governmental control in June had carried raw silk down by October to the lowest levels in its long history. We mentioned politics as prompting the decision to loan the filatures 1250 Yen a bale, this silk to be withdrawn from the market and held under the terms of the loaning plan, and this assumption seems sound because it represented a radical departure by the present syndicate from the methods of previous ones. The syndicates of 1920 and 1924 bought the silk outright from the reelers. They were content to take their chances on the market being as high or higher when they came to liquidate their holdings. It is significant that the present syndicate was merely willing to loan on silk that remained the property of the reelers.

The broadsilk and hosiery trades in this country suffered heavy losses in the collapse of prices over the summer and early fall months. Manufacturers bought tremendous quantities of raw silk as each new low level was reached. The end of the debacle came in the second week of October when Saiyu sold at 540 Yen in Japan, high grade warp stock at close to $2 per lb, and the National Raw Silk Exchange in New York at $2.14. Impairment of confidence, due to the heavy losses on carefully calculated purchases of raw silk, prevented much of a recovery in prices up to the year end.

Demand Aids Recovery

But recovery there has been and the fact that, so far, betterment has been expressed in terms of a record-breaking use of raw silk over the last four months of 1930 will have to be given considerable weight in our analysis of what is likely to develop over the first half of 1931. Prices at the start of the new year rule only moderately above the low point. Saiyu in Yokohama is 680 Yen, a recovery of 140 Yen. Average levels in New York are about 45c. a pound above the low with the gain in the warp sizes somewhat more pronounced. The National Exchange stands at $2.50, up 35c. a pound from the absolute low of $2.14.

As regards Japan, conditions showed progressive improvement in the closing months of the year. Much of the blame for the fantastically low prices at which raw silk sold can be laid at the door of the Japanese. First, there was the unsound move to maintain prices prior to the spring cocoon season which encouraged the farmers to produce a crop 10% in excess of 1929. Second, there was the utter disorganization in the marketing of the spring and fall cocoons which carried prices for the fall crop down as low as 15 Kake. This latter compares with the lowest level in recent years of around 60 to 65 Kake.

The deflated prices for silk in Japan have done two things during the last 5 months. They have discouraged the reeling of export silk and have stimulated the domestic consumption. The into-sight movement over the first six months of the season has run at a rate 12½% below the same months of 1929. These reduced arrivals in the

export markets of Yokohama and Kobe, when taken in conjunction with the record quantities consumed in America, have vastly improved the statistical position of the market. Visible stocks at the end of December, exclusive of the 110,000 bales held by the syndicate, show a 49,000 bale drop from this time a year ago. The New York stocks, Japanese port stocks, and silk in transit on Dec. 31 stood at 115,000 as against 164,000 bales last year. Thus, of the 110,000 bales held under the loaning plan, only about 60,000 bales represent pure surplus.

The 12½% reduction in the into-sight movement, however, will stand a little analysis. Taken in conjunction with a crop of cocoons equal to that of last year, the reduced arrivals from the interior might simply mean that at the end of the season there would exist an invisible carry-over in the form of unreeled cocoons. Though the lessened reeling operations result from an unwillingness on the part of the filature to reel silk at the low prices, the invisible stock would still exert an influence.

Japanese Weaving Boom

It is in connection with this angle that the reports of a boom in the domestic weaving industry in Japan are of real importance to the American user. Since the middle of 1930 when prices hit their first bottom, the returns to the interior from Yokohama have assumed large proportions. The low prices have given a remarkable stimulation to the buying of silk goods in Japan, despite the depression. During recent months the subject of domestic consumption in Japan has received close attention for the first time. Judging from the very large returns to the interior over the last 6 months indications are that the total use will exceed 150,000 bales for the full year. This would run 50,000 bales above the average of recent years, reducing the theoretical surplus by that amount.

To aid the disposal of the 110,000 bales of syndicate holdings over the coming months, it has been decided by the committee to bring about a total suspension of reeling in March 1931. And further to insure the needed scarcity of raw silk over the spring months, filatures will not be permitted to speed up production in the months of January and February. The normal winter shutdown ordinarily could be counted upon to reduce arrivals during these months but to make sure, filatures will be rigidly restricted in allotments of silk permitted to arrive in the export markets. These allotments cannot exceed the average of the years 1928 and 1929.

While this new attempt to interfere with the free working of the law of supply and demand is of course distasteful to the trade here, it has been accepted in better part than the abortive effort of a year ago.

What it aims to do is to force the American broadsilk and hosiery manufacturers to dip into this surplus against their current consumption needs. The banks of Japan which have granted the loans to the reelers will thus be relieved of a huge body of frozen assets. While some losses will probably ensue these will be chargeable against the filatures, less of course the guarantees granted by the Government.

Will it be possible to force the trade here to use some or all of this silk? The writer believes that it will. Provided that, should the spring business in fabrics and hosiery develop only moderatey, the prices are kept in reasonable bounds; and, provided also, that in event business turns unexpectedly good, the Japanese restrain their desires to get back all the losses and still keep the market at a level which will not encourage another large crop in June.

It is well to remember that we are still dealing with a market which is not entirely free and open. Yet the recuperative effects of low prices on silks have been so striking that moderate optimism is permissible. The general situation in the United States over the last four months of 1930 was difficult. In the face of admittedly trying conditions it is an important fact that the shipments of raw silk would indicate perhaps the largest sustained use in the history of the trade. Measured by mill deliveries, September was the most active September we have ever had, and the same can be said for each succeeding month up to an including December. October's delivery to mills of 61,900 bales was the peak for all time.

Different individuals may interpret these remarkable figures differently. The writer's belief is that the utterly deflated prices together with the values that could be offered have brought raw silk into new fields of use in addition to stimulating the normal channels of distribution. Furthermore, there has been a trading-up policy all along the line resulting in a significant trend away from weighting and toward pure dye goods. With silk under $3 per lb., it is almost as cheap to include the extra 8 or 10 pounds per hundred yards as it is to weight the goods with tin. That the enormous use of silk over the fall months has not resulted in any large accumulation of finished stocks, can be gleamed from the broadsilk stock figures reported by the Silk Association. Representing about 50% of the trade these can be accepted as indicative of the whole. They show a progressive reduction as compared with the same months in 1929. September was 10.9% below September of 1929, while by Dec. 1 the total was reported as 15.1% below Dec. 1, 1929. These totals are reported in yardage and not in dollars.

The only visible fly in the ointment is the cut in rayon prices which has just been announced. While this presages an increased use of rayon again in the crepe field, we do not believe that it will alter the situation radically. The large use of silk in recent months has been partly but not entirely at the expense of rayon.

Having used many millions of pounds of rayon in recent years, silk manufacturers have no prejudices in the matter. It is likely that the majority will continue to run silk over the coming months because of better profit-making opportunities.

With visible stocks of raw silk on Dec. 31, outside of syndicate holdings, 50,000 bales under a year ago and consumption steadily keeping to its record-breaking pace, the price situation will be dominated in coming months by the decisions of the syndicate. The banks and reelers are guaranteed down to about a price of 900 Yen as we understand it. From then on the reeler stands the loss —or the bank, in case the reeler cannot make good. The liquidation of the 110,000 bale stock will result, we believe, in a compromise between the necessities of the situation and the desire of the filatures to come out whole. The present price for Saiyu is 680 Yen. In all probability the sale of the Syndicate holdings will be accomplished on a higher basis than this. A range of prices from 700 Yen to 850 Yen seems a likely one between now and May 1.

Trend to Finer Deniers

Confronts the Rayon Weaver

By John Picone

THE relatively small number of new fabrics composed in whole or in part of rayon which were brought out in 1930 gives no indication of the vast amount of development work which has been going on during the last twelve months. In broadsilk mills, for example, considerable attention has been paid to the possibilities opened up by rayons of fine denier and a large number of filaments; and experiments made with these yarns, both alone and in combination with Japan silk of fine denier, have been remarkably successful. These results are particularly gratifying, since use of high-grade rayon—having few broken filaments or ruffled skeins—requires little processing, and thereby permits manufacture of fabrics containing this yarn at a comparatively high speed without difficulty.

High-Speed Warping

An innovation which will contribute to the increased use of rayon is the large-sized skein, which is made possible by modern winders equipped with automatic stop motions and oil-less bearings. Again, in warping rayon there have been many improvements. High-speed warpers designed especially for rayon have been brought out, which embody a number of refinements designed not only to increase production and reduce labor costs, but also to improve the quality of the goods. One recent development is an arrangement which insures even tension throughout the length of the warp; another is a yardage clock set to stop the warping mill at cross marks and at the end of each section. With the more general use of paperless warp beams has come the realization that care must be taken in beaming and that a properly adjusted beam is necessary to prevent ends from rolling on the edges.

Progress in warp sizing includes the introduction of a sizing machine designed especially for acetate yarns and a number of improvements in other types of equipment for sizing rayon.

Together with the above-mentioned mechanical improvements has come the development of sizing materials intended particularly for use in the treatment of rayon and acetate yarns. Unfortunately, many of the broadsilk mills are not equipped with sizing machines and are forced to have the sizing done outside. This arrangement is far from satisfactory, leading at times to discouraging results and damage to the warps in transportation.

•Progress in Weaving

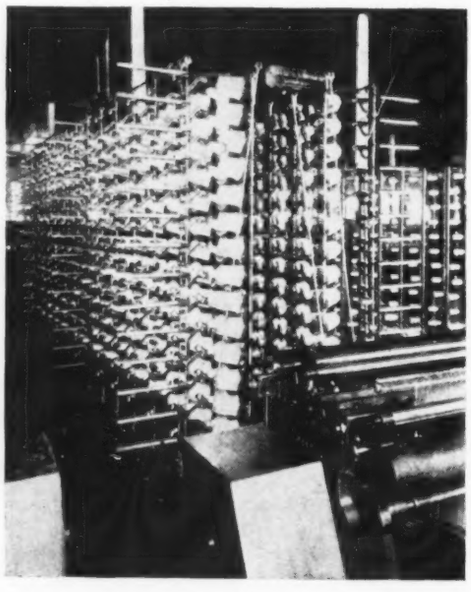
In weaving of rayon, while considerable effort has been made to eliminate seconds, further steps must be taken to obtain the best results. Harness of the heavy type and heddles of modern design are requisite. For use with rayon of fine denier, the oval reed is gaining favor. This reed allows the knots to pass through readily, thereby giving less loom stoppage and producing a better fabric. Warp beams should be of the large-flange type with a yardage from 1,500 to 2,000 yd. per warp. Use of let-offs is found to be essential to prevent shirey cloth and cracks.

Constant menaces in the weaving of rayon are grease spots and dirt. When the loom is in motion, there is always the chance of grease flying from picking balls and other revolving parts. Yet many mills make no attempt to guard against these evils; although to prevent grease from getting on the fabric, it is only necessary to tack a piece of paper on the inside of the breast beam and one on the outside.

Scant Reason for Seconds

With the modern looms now available, the reason for seconds is often nothing but haphazard loomfixing. More careful training of loomfixers is a factor in mill management which should be carefully considered. The question is often asked: "How many looms should be given to a weaver?"

With the modern automatic loom of today the general practice is for a weaver to operate eight looms, but with the growing use of large warps and with modern equipment kept in tip-top condition, it is only a question of time when a weaver will be running sixteen to twenty looms.



High-speed warping of rayon is made possible with modern equipment

Keen Competition in Rayon Industry

Is Spur to Technical Progress

Rayon takes properties of its raw material

BITTER competition and drastic price cutting in the synthetic fiber industry has served to stimulate technical development. Thus, in the following summary of progress reported by TEXTILE WORLD in 1930, two marked trends are evident. These are increased plant efficiency, which makes possible lower manufacturing costs; and intensive research, which promises products of better quality. Reduction of costs has been effected by installation of improved equipment, by more efficient recovery of chemicals, and by elimination of unnecessary labor. Products superior to those now on the market should follow the new knowledge of cellulose and its conversion into synthetic fibers.

While many of the larger producers of rayon develop machines suitable for their particular requirements, machinery manufacturers—both in this country and in Europe—are active in bringing out improved types of equipment which have more general application. One of the outstanding machinery developments for the manufacture of viscose is apparatus designed for the continuous preparation of alkali cellulose. Of equal importance is the introduction of bobbin-spinning equipment by means of which bobbins up to 125 mm. in size are handled successfully. Other innovations include a combination filter press and immersion trough which largely eliminates manual operation, a self-emptying viscose desintegrator, and spinning pumps which obviate difficulties formerly encountered by fluctuating pressure and stoppage of the spinning nozzle.

Little information has been divulged recently as to progress made in desulfurizing and bleaching pot-spun rayon in the cake. Difficulties now in the way will doubtless be overcome; but, as yet, general practice is to desulfurize and bleach in the skein. There has been announced, however, a combined desulfurizing and bleaching machine suitable for treating both bobbin- and pot-spun rayon. With this equipment, since the yarn is taken from the reeling machine directly to the washing, desulfurizing, and bleaching apparatus, it is not stretched or dried before desulfurizing.

In the manufacture of acetate yarns improved equipment has made possible spinning speeds up to 450 meters per minute. Other developments in this field are the application of chrome iron in mixers and shredders and nickel and Monel metal in the construction of spinnerets.

More attention than ever is being paid to the reclamation of chemicals, and greater efficiency is being attained. In the acetate process, improved recovery systems are said to reduce the loss of acetone to 6% or less. In the viscose process, dialyzers of special construction are now generally employed for the recovery of caustic soda.

Recent studies have shown conclusively that the properties of synthetic yarns are influenced to a marked degree by the original properties of the raw materials. It has been found that a discolored pulp will produce a discolored yarn; a soft-handling-pulp, a soft-handling yarn; and that the property of strength in the raw material appears to be transmitted to the finished product. It has been proved too that in the manufacture of rayon both the time of steeping and the concentration of alkali are of vital importance if satisfactory yarn is to be produced. Investigations of the structure of cellulose and of synthetic fibers indicate that size and arrangement of the micelle clusters are very important. Lilienfeld rayon is believed to derive its high strength from the fact that the cellulose micelles are aligned parallel to the fiber's longitudinal axis at moment of coagulation.

Research goes on apace. The appearance of rayon has been improved by adding various substances to the spinning bath to give a dull or opaque luster. Finer filaments are now produced. Yarn of better strength and elasticity seems not far away. Suggestions for raw materials to replace wood pulp and cotton linters do not abate. Rumors of entirely new synthetic fibers continue. "Meantime," says one authority, "the industry is making technical progress year by year along those paths of steady and painstaking development which have been followed by every great industry."

Rayon's Onward March Halted

By Douglas G. Woolf

Editor, TEXTILE WORLD

THE domestic rayon production curve, an unbroken upward line in the decade commencing with 1920, started the new decade with a dip. TEXTILE WORLD's estimate of the 1930 output, in the United States, of rayon and other synthetic fibers, is 119,000,000 lb., against 123,130,000 in 1929. Thus is recorded the first halt in an onward march which started with a production of 9,000,000 lb. in 1920 and ended with an output nearly 14 times as great in 1929.

Domestic consumption last year declined more sharply than did production. Imports were less than 6,000,000 lb. as against nearly 16,000,000 lb. in 1929. Surplus stocks at the end of the year were far larger than ever before. Allowing for these factors, we estimate 1930 consumption at 105,000,000 lb. as against 132,000,000 lb. in 1929.

In presenting this year's survey, it must be emphasized that our estimates are purely approximations. Producers displayed a reticence, in giving data, hitherto unknown. Whereas in past years most companies supplied official statements, many stated frankly this year that conditions in the industry made such publication inadvisable. Nevertheless, the figures in the accompanying table have been checked carefully and are believed to be within the realm of reasonable accuracy.

Naturally under present conditions it is difficult, if not impossible, to predict 1931 production and consumption with any degree of assurance. Productive capacity this year is approximately 175,000,000 lb. We have estimated roughly that there will be a demand for about 75% of this quantity, or approximately 130,000,000 lb. However, when allowance is made for the absorption of the large carry-over and of the imports, which probably will be small, the outlook at present would indicate that plant operation at not more than 65% of capacity would be warranted in 1931.

This, we would say, is facing the situation at its gloomiest. It is entirely possible that general textile improvement will be sufficiently broad to create a demand for more than the 25,000,000 lb. increase over 1930 rayon consumption assumed in the above calculation. It is also possible that aggressive sales effort plus sounder production and merchandising policies will be forthcoming.

The latter is of course the most important consideration facing the rayon industry. The statistics given in this article, although depressing, do not by any means fully reflect the chaos and demoralization which have characterized the market during the last year. They do not tell the story of the inter-company bitterness which developed. They do not reveal the sub rosa price cutting, both actual and rumored, which preceded the price reduction from $1.15 to 95c. in July and, again, the latest cut to 75c. early in January, 1931.

TEXTILE WORLD'S Estimate of Domestic Production of Rayon and Other Synthetic Fibers

	1926	1927	1928	1929	1930
Viscose Co.	37,000,000	41,000,000	54,000,000	62,000,000	45,000,000
Du Pont Rayon Co.	10,900,000	15,100,000	18,231,000	24,500,000	18,500,000
Tubize Chatillon Corp.	7,000,000	7,500,000	8,500,000	*10,250,000	*9,850,000
Celanese Corp.	2,500,000	3,500,000	5,000,000	7,000,000	10,000,000
Industrial Rayon Corp.	3,400,000	3,450,000	4,250,000	5,375,000	10,000,000
American Glanzstoff	.....	.....	350,000	3,850,000	7,000,000
American Enka Corp.	.....	.....	.....	625,000	6,000,000
American Bemberg Corp.	.....	.....	2,100,000	2,300,000	2,000,000
Skenandoa Rayon Corp.	.....	.....	1,150,000	1,330,000	2,000,000
Delaware Rayon Co.	.....	500,000	1,500,000	2,000,000	1,750,000
Belamose Corp.	875,000	1,400,000	1,380,000	1,500,000	1,600,000
Woonsocket Rayon Co.	.....	.....	.....	.....**	1,285,000
New Bedford Rayon Co.	.....	.....	.....	500,000	1,400,000
Acme Rayon Corp.	400,000	500,000	740,250	900,000	965,000
Hampton Co.	.....	.....	.....	.....**	1,000,000
Other Companies	500,000	2,100,000	500,000	1,000,000	650,000
Total	62,575,000	75,050,000	97,701,250	123,130,000	119,000,000

*Combined production of Tubize Artificial Silk Co., and American Chatillon Corp. **Included in "Other Companies" in 1929.

When we state that rayon's onward march has been halted, we do not imply that the synthetic fiber development has reached its peak. We must re-emphasize our belief that it has only started. Nevertheless the industry has very definitely come to a critical stage. A continuation of 1930 conditions cannot prevent the ultimate expansion of synthetic fiber use, but can postpone that expansion needlessly, and at great loss to both the producing companies and the consumers.

Our knowledge of the personnel in the industry impels us to believe that in 1931 there will be a return to sanity.

World Rayon Consumption Off

From TEXTILE WORLD'S *Manchester (Eng.) Rayon Correspondent*

IN THE last Annual Issue of TEXTILE WORLD it was pointed out that to forecast production during 1930 was well nigh impossible. One thing, however, that is now clear is that even the guarded optimism we expressed at the start of the year was not fully justified. We pointed out then that the general indication was that the industry was slowly emerging from its troubles and that with better prices obtainable some measure of prosperity would return. We also indicated that in Europe at least the old profit margin would never be regained and that producers would look for larger consumption to compensate for this. Careful calculations, however, bring us to the conclusion that world consumption during 1930 actually decreased. In the accompanying table details are given of the world estimated production and consumption during 1930.

The output of 426,700,000 lb. compares with the revised estimate of 442,420,000 lb. in 1929. Consumption is estimated at 388,500,000 lb. This means an apparent increase of 38,200,000 lb. in world stocks. [We believe this estimate of surplus is ultra-conservative, and that world stocks have increased to a greater degree. —*Editor.*]

In another table, an attempt is made to show world production by processes for both 1929 and 1930. This is offered as an approximation only, as it is impossible to get an official "break-down" of statistics in many cases.

If it was difficult to forecast the trend of production for the year 1930, it is doubly so when one contemplates the outlook for 1931, saddled already with a huge carry-over from the previous year. It is scarcely to be expected that world prosperity will be sufficiently restored to allow of a very much larger consumption, and although in individual countries conditions will vary, it is to be hoped that producers will act with foresight and rather than pile up stocks will rationalize their output.

As we indicated a year ago, the European producers who it will be seen from our first table have an enormous surplus to deal with, cannot look for assistance from the United States. The individual countries on the European Continent will no doubt continue their policy of selling wherever possible to each other. This merely involves a transfer in business from one country to another and does not really alleviate the position.

Great Britain is rather better placed than the other European countries, for in addition to a large home market she appears to refrain from entering the price-cutting war in the export trade by reason of the huge resources of the leading producers. It is true on the other hand that Britain suffers from the high rate of wages paid, but few people in the country seriously believe the protective tariff will be interfered with during 1931.

All the European countries have suffered from the falling off in the export trade of fabrics due firstly to world depression and secondly to the competition of Japan. This latter country in her turn has built up an industry of very large proportions and has captured the greater part of the trade in rayon fabrics in Asia. The fall in the price of silver and of other commodities is forcing Japan's attention to other markets and her domestic production will be limited in accordance with the success met with in this direction. Canada is likely to increase her production and decrease her imports. There is no immediate likelihood of the financial position in Australia improving sufficiently to allow of much increase in production but there may be room for some degree of improvement in South America.

On the whole, therefore, production in 1931 cannot be expected to exceed that of the present year unless an improvement, which cannot be foreseen at the present time, takes place.

WORLD PRODUCTION AND CONSUMPTION OF RAYON

1930

(In thousands of lbs.)

	Production	Imports	Exports	Estimated Consumption
Belgium	12,500	1,750	6,750	7,000
Great Britain	49,700	675	6,600	42,400
France	41,600	2,450	17,975	23,000
Germany	50,300	25,900	15,775	59,000
Holland	18,750	2,350	19,600	2,600
Italy	66,400	1,975	34,000	30,000
Switzerland	10,650	4,050	8,850	5,250
Other European	17,350	33,205	5,655	43,250
Total European	267,250	.....	.....	212,500
Japan	35,100	525	2,500	29,000
Other Asia	.....	26,075	.....	24,200
Total Asia	35,100	.....	.....	53,200
Total Africa	.....	1,900	.....	1,900
Canada	5,350	2,000	.....	7,250
United States	119,000	5,575	360	105,000
S. & C. America	.....	6,250	.....	5,400
Total American	124,350	.....	.....	117,650
Total Australasian	.....	3,825	.....	3,250
Grand Total	426,700	.....	.....	388,500

WORLD PRODUCTION OF RAYON BY PROCESSES

(In thousands of lbs.)

Process	1929	%	1930	%
Viscose	387,365	87	373,525	88
Acetate	25,168	6	30,100	7
Cupra	18,216	4	14,145	3
Collodion	11,671	3	8,930	2
Total	442,420	100	426,700	100

The latest in sweat-shirts by High Rock Knitting Co.

Color Variation

Features 1931 Knit Goods Style Trend

By John Black
Assistant Editor, TEXTILE WORLD

BUSINESS depression tended to discourage creation of original style in the knit goods field during the past year, but despite the hesitancy certain significant changes did register and some of these promise to be important during 1931. Color variation is a leading factor. In bathing-suit manufacture this season, the tendency is toward French zephyr, but this presents several handicaps. Manufacturers themselves incline to ribbed suits because French zephyr goods cannot stand cheapening, and the result of over-emphasizing the zephyrs would be to flood the market with inferior goods, prejudicial to the interests of the industry. Indications are the ribbed suit will continue to dominate in 1931, with solid colors in greater favor than mixtures, and with two-tone effects more important. There is no radical change in models, and none is looked for. In men's sweaters, there is a strong sentiment for greater design variation, but the uncertain market made manufacturers hesitant; improved business this year should bring new color effects, not necessarily livelier, but varied enough to prompt quicker turnover.

Women's Outerwear

Women's street knitwear is marked by numerous style changes. Berets lean to artistic effects, and the widespread use of rayon allows for many striking color combinations. Emphasis on quantity rather than quality output last season had an unfortunate trading-down effect and in many cases served almost to eclipse the style factor. Knitted ensembles continue their trend toward ultra-feminine lines, especially the three-piece suit, though the importance of dark shades rather modifies this; greens, blues and browns are favored, but there is no dominant shade; tints and pastels are less important. The past year brought the boucle into popularity, and this demand may continue through 1931; the growing emphasis on jersey, however, tends to offset such a development. Stylists regard the jersey suit as important this year. Boucles have been produced in all possible combinations — wool-and-rayon, wool-and-silk, and in a triple mixture of wool, cotton and rayon—and enjoyed fashion's approval throughout the fall.

Women's sweaters are more decorative, both in cut and color. Jabots are fuller at the bottom and of varied lengths, permitting the wearer to tuck it inside the skirt if she so desires. The blouse idea is being adapted to women's sweaters; this accords with the feminine vogue and may be more important in the coming season. The polo skirt, so popular during 1930, rather discouraged the development of new sweater styles. Polos for women were distinctly boyish, and—especially in the rayon line — color was a primary consideration. High shades were sportily blended, but the consumer interest seemed to be equally divided between gay effects and plain pastels.

Courtesy Wm. Whitman Co.

A sports combination by Worth shown at Deauville

Women's polos for 1931 vary more in design than in cut.

One significant development is the trend toward knitted beach pajamas. Accompanying photographs, taken by Seeberger, Paris, show new models. The photographs were obtained by William Whitman Co., Inc., from their Paris commissionaire. They demonstrate the use of knitted worsted fabrics for beach apparel. This vogue is considered by leading authorities here and abroad as the dominating style change evident at the Riviera resorts. True to the usual style cycle, it is now being rapidly accepted at our own Southern resorts. The photographs display models by some of the foremost couturiers in Paris.

This trend would seem to open a new field to manufacturers of jersey cloth and knitted outerwear for volume business during the summer of 1931 and succeeding seasons. In French spun worsted Whitman represents the Monomac Spinning Co., of Lawrence, Mass., and in English spun worsted they sell for Arlington Mills, Lawrence, Mass.

Courtesy Wm. Whitman Co.

A Lanvin model in jersey cloth shown at Biarritz

Style in Underwear

In underwear men's styles continue conservative; the attempt early last year to popularize such shades as salmon in heavyweight cotton underwear, did not prove very successful; there is still a limited number of mills offering bright colors for men in winter weights, but consumer demand is not encouraging. There is a growing call for white heavyweight underwear, to take the place of natural and gray shades. Certain mills offering white, among their natural and gray numbers, report a good response and further development of white for heavyweights is possible.

Fashion and mechanical development have brought several important changes in women's underwear. Recognizing the increasing interest taken by women in sports, mills are offering undergarments especially designed to give the desired freedom, and made from knitted fabrics at once soft and strong. This is true in all divisions—glove-silk, rayon and cotton. In rayon, there is a growing demand for greater run-resistance and increased strength, one result of which was wider call for tricot garments; the tricot, while a non-run fabric, has not enough elasticity, some claim; the new Rubenstein run-resist patent which permits manufacture of circular knit underwear fabric at lower cost, is an important development in this field.

Durene Activities

Some significant work is being done by mills producing mercerized cotton underwear for women. Working under the guidance of the fashion department of the Durene Association of America, headed by Miss Kathryn I. Day, the manufacturers have added numerous original

Durene Association

Well styled knit underwear for women finds a wide market

numbers to this season's lines. These developments bring novelty both in knitting constructions and in modelling and finishing. The new features include: especially designed brassiere stitching, newer shoulder straps, new panty leg designs, sport shirts cut to give greater freedom, step-ins developed in accord with the lines of the new silhouette, higher reinforced waist bands, compact, body-clinging hip-lines; facings and other finishing touches largely new to the cotton underwear field. These innovations are in line with the latest trends, as ascertained by the Durene Association through close and constant contact with leading fashion authorities.

In construction, the following new features of mercerized cotton underwear may be cited: novelty meshes of various types, and interesting departures in adaptations of French meshes; new feather-weight ribs and flat knits, and extremely strong sheers.

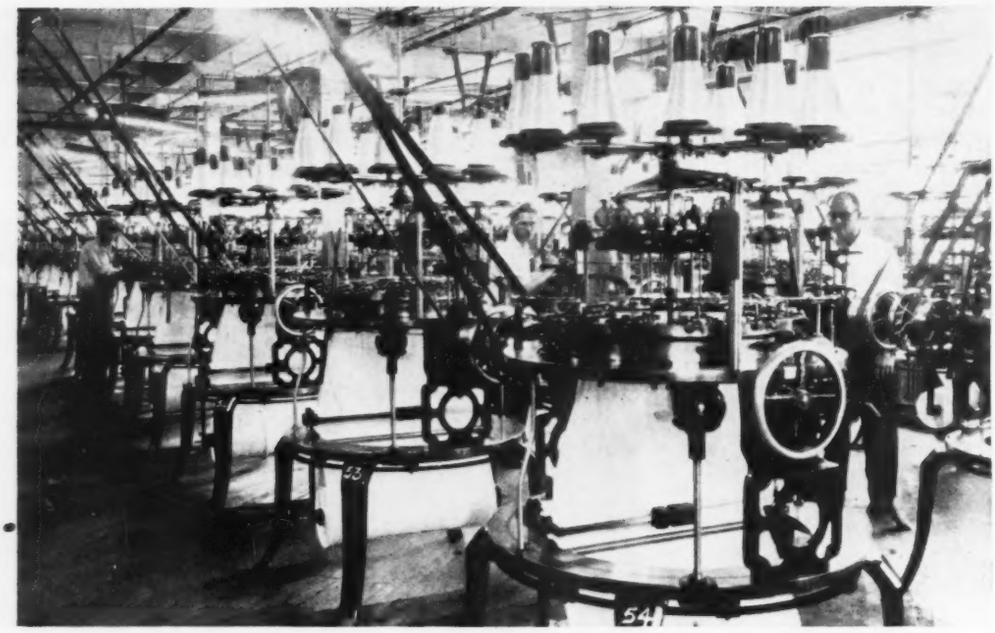
There have been two trends in mercerized cotton underwear development: first, toward increasing production of garments especially suited to active sports—highly absorptive and porous, soft sturdy garments; and second, toward sheer, smartly cut and finished garments for use with cotton frocks for town and country; and to be worn under the new tweed suits and dresses with which the mode demands especially firm soft and practical foundations and the complete avoidance of bulkiness.

The introduction of pastel colors in knitted cotton underwear has also been an important development. Washability has been stressed.

Dull-Luster Hosiery

Hosiery also felt fashion's impetus during the year. Perhaps the outstanding changes occurred in the women's full-fashioned field where the demand for low-luster became so pronounced as to create a vogue. The history of the crepe-grenadine hosiery "boom" is well known. Suffice it to say that women have indicated a definite inclination toward hosiery which has a minimum sheen, and the prospects are that dull luster hosiery will continue important this year. Crepe-grenadine hosiery, however, is growing in popularity more for its durability than for its low luster.

In the field of men's goods fancy half-hose lean to all-over patterns of small design; there is a trend away from the heavy central panel, and toward small effects; neater clocks, minute checks and trick designs not unlike polka dots are favored; florals and star patterns, conservatively colored, also are important. Browns and blues, in subdued mixtures are the preferred colors. Men's golf hose lean to solid colors; however, while single-shade numbers were well received during 1930, checks probably will remain important.



Run-resistant circular fabric is raising the consumer's respect for rayon underwear.

Greater Standardization

Among Coming Technical Developments In Hosiery, Underwear, and Outerwear

By W. E. Shinn

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THE last year has witnessed increased popularity in fancy half-hose ornamented on the wrap-stripe principle. One wrap-stripe machine has been improved so that patterns may be made in fourteen steps and an equal number of colors. The variation in texture, the full solid-color lines, and the possibility of producing clocking effects have been responsible for the popularity of this type of hosiery.

The flat effects obtained by reverse plating have not been of first importance in circular-knit hosiery of the best quality. The indications point to increased demand for conservative hosiery with clocking effects added by the machine itself or by special sewing machines. The patterns of the future will doubtless be developed by differences in texture in the pattern and ground fabric as well as differences in color. The consumer will no longer be satisfied with flat effects in color. Variations in texture produced by tucking, floating, or welting, or further manipulation of an extra thread for ornamental effects, will no doubt be resorted to by the machine builders and hosiery manufacturers in the field of men's fancy hosiery.

Grenadine

During the last year grenadine has been of considerable importance in both the seamless and full-fashioned branches of the hosiery industry. The principal features of the grenadine stocking are (1) subdued luster arising from extra twist in the yarn, (2) greater durability resulting also from the insertion of twist, and (3) greater elasticity. The recent demand for grenadine was given birth by the fad of wearing hosiery wrong side out.

Grenadine yarns are made on the organzine principle of plying two or more strands of yarn twisted in the same direction and twisting the ply yarn in the opposite direction. A four-thread hosiery yarn may be made by twisting the single thread with 36 turns to the left and twisting the four-end yarn with 32 turns to the right.

The demand for grenadine has given additional business to throwsters; and some difficulty has been experienced in supplying the knitter with sufficient yarn to meet the demand for dull hosiery, due to the low production of a throwing plant on this kind of yarn.

Grenadine has also created new problems for the

knitter, who has never looked with favor on yarns with high twist. In general, his problems have been overcome by effective soaking methods and the use of softening agents, such as olive oil, olive soap, neatsfoot oil, and other emulsions. As to whether the demand for grenadine hosiery will continue permanently is yet to be seen. The desire for dull hosiery alone is not likely to cause the demand to keep up indefinitely. But the advantage of increased durability is a factor in the sale of this type of hosiery, and the extent to which the consumer is willing to go in paying for increased throwing costs in order to get a more durable stocking remains to be determined.

The wearing of dull hosiery has also influenced rayon production. The hosiery mills have been the chief consumers of low-luster rayon. Various methods of reducing the luster of rayon have been used by processing plants to get the desired effect, but these have been largely superseded by the rayon concerns, each of which has now added a low-luster brand to its line.

It is very likely that these products will meet with permanent demand in knit goods, as they produce more conservative-appearing merchandise, which is always in demand by people who do not care for the more brilliant effects characteristic of the more lustrous rayon materials.

Trend to Finer Gauges in Hosiery

According to an estimate made by Dr. George W. Taylor, of the Wharton School of Finance and Commerce of the University of Pennsylvania, the 39-gauge machine represented 75% of the year's production in 1919, 1920, and 1921. In 1922 the 42-gauge machine increased in importance, and in 1926 over 75% of the machines produced were 42-gauge machines. In 1928, 29.8% of the new machines were 45-gauge. In 1929, 50.1% were of this gauge, while only ten 39-gauge machines were installed.

As necessity is the mother of invention, so is competition the parent of progress. When the product of our present machinery fails to meet with a ready demand, immediately someone will find a means of refining it and thereby turn out a superior product. Only a few years ago chiffon hosiery made on a 39-gauge machine from a five-thread silk was considered the limit in finer gauges. Today the manufacture of a four-thread silk hose on a 45-gauge machine is common practice, while machines of 54-gauge are finding a greater demand.

In the seamless branch, 260 latch needles was considered the maximum in gauges for latch-needle machines little more than five years ago. Today, with improvements in latch needles and refinements in the design of the machine itself, 340-needle hosiery machines are in use commercially.

The trend is toward finer gauges and lighter weights, and this will doubtless continue so long as fashion demands something finer and more exclusive. If the approach to finer constructions threatens to weaken the structure of hosiery beyond the point where it will be sufficiently durable with our present yarns, someone will produce a yarn of finer denier and even greater strength than that possessed by the yarns now available.

That there is a definite trend toward the machine of greater number of sections is also shown in the report of Dr. Taylor of the University of Pennsylvania. The table on the next page shows the yearly production and importation in machines and sections, and the average sections per machine for the years 1920 to 1929 inclusive. A glance at the column under average sections per machine shows that the average machine in 1920 was built with 18 sections with a steady increase to 24 sections per machine in 1929.

This increase has been due in part to increased skill and added ability of knitters to look after more sections. The longer machine is also easier to operate than two shorter machines, and there is a lower overhead cost due to the smaller cost per section of the longer machine.

Combination Legger and Footer

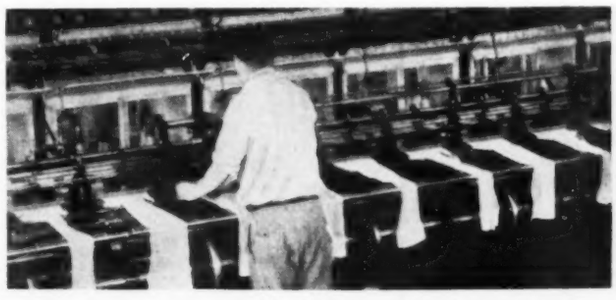
The last year has witnessed a revival of interest in the possibility of the combination legger and footer becoming a reality in full-fashioned hosiery mills. Such a machine has been the dream of inventors for a number of years. Among the advantages claimed for this machine are reduced labor costs, smaller floor space, lower first cost, lower percentage of seconds due to the elimination of transfer operations, avoidance of imperfect matchings between the leg and foot, and a reduction in the time required for knitting a stocking.

While there is some conjecture regarding the practicability of the single-process machine, it is generally conceded that it represents one of the most important developments of the knitting industry during the last few years. No doubt there are some refinements yet to be made on a machine which represents so radical a departure from established practice. Yet the next few years are likely to find the machine of growing importance in an industry where competition is on the increase. On the other hand, the large outlay of capital in the present types of full-fashioned machines will naturally cause the trade to go to new equipment with reluctance for many years to come.

Wrap-Stripe Principle in Outerwear

Notable among the recent advances in the manufacture of fabrics for fancy sweaters is the introduction of the so-called wrap-stripe principle. This method of ornamenting knit goods was given serious consideration by machine builders and knitters about three years ago and at the present time is meeting with favor in hosiery and outerwear fabrics of both jersey and rib construction. The principal use to which it has been put in fabrics for outerwear is in the ornamentation of fancy rib fabrics. The chief advantages of this method of forming a pattern is the preservation of the natural elasticity of the rib construction. Machines of this type are also economical in the use of colored yarns, due to the fact that the pattern is formed entirely on the outer surface of the cloth, since the ornamenting threads are supplied to the cylinder needles only.

Outerwear fabrics ornamented on the wrap-stripe



Improved skill of full-fashioned hosiery knitters has permitted use of more sections per machine

principle are likely to increase in favor in sweaters for college and sport wear and in bathing suits, which have not as yet consumed any large quantity of fancy fabrics. The bathing suits of the future are likely to be put on the counter not only in bright colors but in suitable combinations of attractive colors by some convenient and simple method of producing designs in knit goods. The wrap-stripe principle is especially adapted to patterning in rib fabrics because it does not alter the speed of production, does not make the fabric less elastic, and is economical in the quantity of colored yarns required to produce a full tone of color in the fabric.

Trends in Rayon Underwear

The indications point to improvement in quality and volume of fabrics consumed by the rayon underwear trade. The trend is toward the use of yarns of finer deniers and toward finer-gauged machines for the production of a higher quality of material. The trend to finer deniers has been encouraged by a cut in price on the finer deniers, and also by an improvement in the quality of the yarn, which makes it easier to manipulate on the knitting machine. The higher-quality material is thus made available to the consumer at a price which compares favorably with the price formerly placed on materials made from the coarser deniers.

According to figures given out by an official of one of the important machine-building firms in this field, there has been an increase of 20% in the number of needles per inch called for in spring-needle machines for knitting rayon underwear fabric. Most of the older machines now in use on this material are 42-gauge machines with 28 needles per inch. During the last year there has been a tendency to go to the 51-gauge machine with 34 needles per inch.

*YEARLY PRODUCTION AND IMPORTATION OF FULL-FASHIONED HOSIERY MACHINES, 1920 TO 1929

Year	Machines	Sections	Average Sections per Machine
1920	593	11,000	18.5
1921	789	14,670	18.6
1922	1,032	19,292	18.7
1923	678	12,806	18.9
1924	471	8,972	19.0
1925	1,139	22,084	19.4
1926	2,134	43,384	20.3
1927	1,731	37,178	21.5
1928	1,620	35,872	22.1
1929	2,624	61,072	23.3

*"Full Fashioned Hosiery Trends," Dr. George W. Taylor, *Textile World*, April 12, 1930.

The movement toward finer quality in rayon underwear is likely to continue indefinitely. Rayon is constantly being made better, and methods of preparing and processing this material are likewise being improved. The finer deniers are available at a lower price and processing costs are lower. These factors, coupled with improvements such as the Rubenstein patent, and control of quality standards by the rayon companies themselves, are likely to have a wide influence in maintaining and improving the quality of rayon knit goods.

Run-Resistant Knitted Fabric

The manufacture of run-resistant knitted fabric from rayon has been given impetus by the formation of the Knitting Arts Corp. by the Viscose Co., the Du Pont Rayon Co., and the Tubize-Chatillon Corp. This group controls the Rubenstein patent, which has done much to elevate the standards for knitted underwear fabric made from rayon and has caused it to increase in popularity due to its greater service value.

The fabric is made on both spring and latch needles and differs from plain jersey as follows: On the first course all needles receive the yarn and knit, on the second course every second needle is idle, on the third course all needles receive the yarn and knit, and on the fourth course the needles which were idle in the second course are raised to receive the yarn and knit. The Knitting Arts Corp. has recently adopted standards covering square yards per pound for each denier, and customer manufacturers agreeing to conform to the standards are licensed and permitted to use a transfer label on their product as a guarantee to the consumer that a garment of quality is being purchased.

Movements Toward Standardization

The standards for unweighted finished rayon underwear fabrics adopted by the Knitting Arts Corp. are as follows:

150 denier and heavier, not lighter than 5.00 sq.yd. per lb.
100 denier, 5.50 to 5.75 sq.yd., not lighter than 5.75 sq.yd. per lb.
125 denier, 5.40 to 5.50 sq.yd., not lighter than 5.50 sq.yd. per lb.
135 denier, 5.30 to 5.35 sq.yd., not lighter than 5.35 sq.yd. per lb.
144 denier, 5.20 to 5.25 sq.yd., not lighter than 5.25 sq.yd. per lb.

This concern intends that the identity of the fabric shall be preserved all the way to the ultimate consumer, in this way preventing the debasement of rayon underwear fabric.

During the last year there has been considerable discussion regarding further standardization of sizes, quality, and trade practices in other branches of the industry. The agitation for quality standards arose out of keen competition and the tendency toward lowering quality to meet a price.

The Associated Knit Underwear Manufacturers of America, in the report of the secretary at its meeting on May 26, proposed a program of standardization as follows: Set up minimum specifications for quality of fabric. Set up minimum specifications for the fabrication of the garment, which includes stitching, inspection, elastic, etc. Standard sizes and measurements for rayon garments through the association's research associate at the Bureau of Standards. Devise a label embodying the statement of the Bureau of Standards as to size and measurements, which will mean that the garment bearing the label complies with the minimum as to style and quality.

The manufacturers of wool and part-wool underwear adopted a resolution at a Federal Trade Practice Conference in Utica, N. Y., to specify on the label the percentage of wool contained in the garment. It is anticipated that the new basis of marking will enable the consumer to purchase more intelligently and form a basis for mitigating unfair competition.

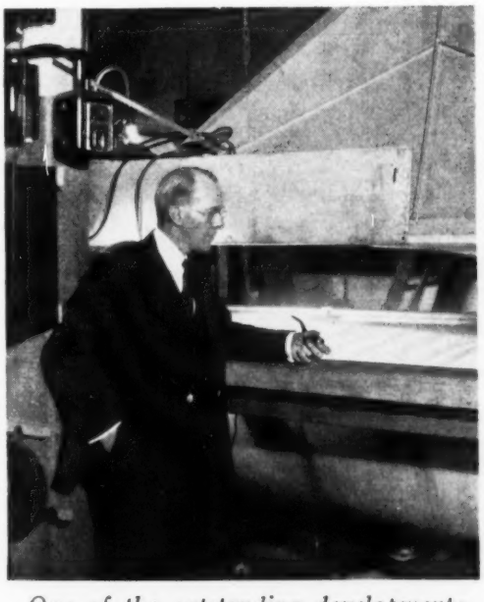
A group of representatives of the full-fashioned branch of the industry met in New York during the month of March and discussed the organization of a Full-Fashioned Hosiery Exchange with regulatory powers to preserve and promote healthy conditions in the industry. Among the objectives of this movement were the adoption of standard specifications, market research, corrective control over trade practices, market stabilization through curtailment, and effective disposition of distress merchandise.

At a meeting of the Knitted Outerwear Association in June, standardization of sizes was one of the topics discussed. A committee on standard sizes was appointed and has since been active in assembling data upon which to base standard-size measurements.

It is quite likely that standards will form an important part of the work of trade associations during the next few years. With increased competition it is imperative that more uniform methods and practices be followed in the industry to avoid undercutting in sizes and quality.

Recent Developments in Wet Processing *Pave Way for Future Progress*

By Winn W. Chase
Assistant Editor, Textile World



One of the outstanding developments in cotton finishing is a method of pre-shrinking enabling positive control

PROGRESS in wet processing during the last year is especially notable because of the marked tendency to replace rule-of-thumb methods with those based on sound underlying principles. This trend is particularly evident in bleaching and finishing of cotton, in scouring and carbonizing of wool, in soaking and degumming of silk, and in dyeing and mercerizing of rayon.

With few exceptions advances in the various wet processes of the textile industry are made not by revolutionary changes, but by gradual improvement of existing methods. It is not strange, therefore, that a number of the major developments of 1930 mark the culmination of several years of effort, and that as yet some of the more recent innovations have not come into general use.

Cotton Processing

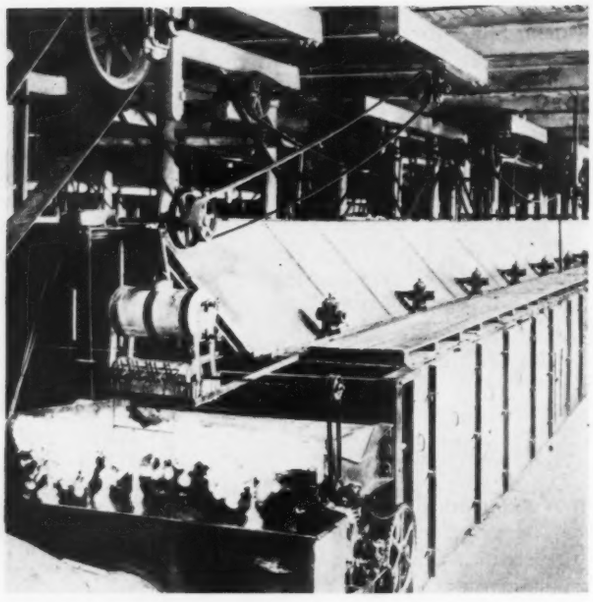
Two outstanding developments in cotton finishing are the widespread adoption of pre-shrinking methods and further progress in continuous bleaching of cotton piece goods. Mention made two years ago of the increased call for pre-shrunk fabrics was climaxed last spring with the announcement of a new method of pre-shrinking which enables positively controlled shrinkage of cotton goods without removal of the luster. This announcement so stimulated consumer demand for pre-shrunk shirtings that today practically every plant finishing these materials has installed some type of pre-shrinking equipment. While attempts to produce non-shrinkable fabrics have been confined largely to broadcloths, oxfords, and similar constructions employed for the manufacture of shirts, extension of the process to include treatment of dress goods, denims, sheetings, and other fabrics is a natural sequence.

Continuous bleaching, long the goal, is nearer now than ever before. Attention has been focused on the advantages of continuously boiling-out textile materials through the introduction of a continuous kier which permits cloth leaving the gray room in the morning to be desized, boiled, and ready for further processing within six hours. In addition, bleaching of a considerable range of cotton and rayon knit goods and woven fabrics by continuous methods has been facilitated by improvements in oxidizing equipment, utilization of the counter-current flow method of washing, and adaptation of the suds box to cotton washers of the slack-loop type. Concurrent with the increased interest in continuous bleaching has come a wider use of peroxide for bleaching cotton fabrics. The most recent development in this line has been correction of the false impression that special equipment is necessary, and the newer knowledge that the usual types of iron kiers are satisfactory for the peroxide bleaching process.

An innovation in mercerizing cotton is a method developed in Europe whereby loose, unspun cotton is impregnated at a high temperature with caustic soda solutions and is then subjected to centrifugal force in a specially designed centrifuge. Another new process announced recently permits mercerizing of cotton roving in the form in which it leaves the slubbers or intermediate frames. Further application of chainless mercerizing of cotton piece goods has followed improvements in the process which enable better control of tension and more efficient washing and caustic recovery.

Fast-Color Dyeing

Continued demand for vat-dyed fabrics has led to improved dyeing methods; and various continuous processes have undergone considerable refinement. To increase the fastness properties of dyed goods, the

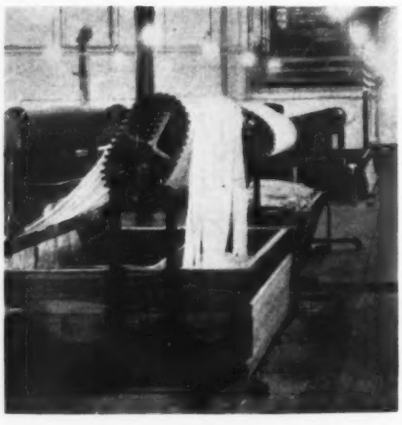


An improved process of wool scouring announced in 1930 minimizes river pollution and reduces operating costs of the department

practice of re-reducing the color has gained considerable favor and ageing methods similar to those used in printing have been adopted. In the application of naphthol colors, sulfonated oils previously employed for dissolving the dyestuffs have been replaced with denatured alcohol and a small amount of a protective colloid. This measure results in better fastness to crocking and eliminates much of the difficulty formerly encountered because of the formation of aluminum soaps in the developing bath. Want of a bright shade of green in the naphthol range and lack of brightness on the part of some vat colors have, in the past, lead to experiments to combine naphthols and vat colors in one bath. This expedient was not wholly satisfactory and now the more general practice is to dye first with vat colors and to top with naphthols.

In printing of cotton and other fabrics we have witnessed in the last year or two the introduction of photographic engraving of printing rollers, and an adaptation of spray-painting methods to the decoration of fabrics. While neither of these innovations bids fair to supersede the older processes, each tends to broaden the scope of textile printing. Recently chromium plating has been found to lengthen the life of printing rollers, and in the future this procedure should find more general application.

Although in the past ozone has been utilized to a limited extent for bleaching, it is only within the last year that a process of ozonizing textile fibers for the purpose of increasing their strength has been suggested. Experiments made with unbleached cotton indicate that the tensile strength of the yarn is increased as much as 35%, and it is believed in some quarters that commercial development of this process may have far-reaching results.



Researches in silk dyeing have established the fact that pH control of the gum-soap liquor is of vital importance

A new waterproofing process, originally developed in England, has made its appearance in this country. Future growth of this and other methods is dependent largely on stimulation of consumer demand for water-repellent fabrics in greater quantity and variety than is now apparent. Specifications for fabrics to be rubberized have been promulgated, which go far toward informing the cotton manufacturer and finisher of the particular requirements in piece goods utilized in the proofing industry.

Wool Scouring and Carbonizing

Until quite recently the traditional methods for carbonizing of woolen and worsted fabrics had undergone little change. The continuous carbonizing process brought out a few years ago has been followed by savings in time and cost, and there is now a decided tendency to discard the older batch methods in favor of the new.

For the removal of tar and pitch from wool, benzine and other inflammable solvents, or high-boiling-point solvents in the state of emulsions, have been in most common use. Recently, however, a new process has been brought out in Europe which employs trichlorethylene as the solvent. It is stated that in this method the loss of solvent amounts to only about 6% on the weight of the wool treated.

Designed chiefly for the purpose of minimizing stream pollution, an improved wool-scouring process has been introduced in which the liquor from the first bowl of the ordinary scouring train is continuously purified by centrifugal force, dirt and grease are removed, and the liquor is returned to the bowl for reuse. Installation of this system is said to have disclosed further advantages which include softer scoured wool, more readily worked, and requiring less oiling; reduced cost of scouring operation; and recovery of salable grease.

The question of the proper oil to be used for oiling wool fiber has for many years defied a categorical answer. Publication early last year of results of extended investigation of the properties, evaluation, and stabilization of wool oils has served to clarify the situation and should prove of immeasurable benefit to the industry.

Development of a new range of vat colors especially suitable for wool dyeing makes it possible for the wool dyer to produce shades of better fastness than has been feasible in the past. With a comparatively simple method of dyeing now available, increased use of vat colors in wool dyeing is but a question of time and demand. Renewed interest in chlorination of wool for producing an unshrinkable finish has brought with it the realization that the conditions of treatment must be carefully controlled to prevent damage to the goods and to secure the results desired.

Three processes in woolen and worsted finishing which in 1930 have come into wider use than formerly are semi-decating, mothproofing, and combined drying and cooling of piece goods.

Increased use of crepe and grenadine for hosiery has stimulated interest in methods for handling these ma-

terials and has resulted in modifications of older processes to meet present-day needs. To secure a soft, supple, and well-lubricated yarn, incorporation of saponified sulfonated oils in soaking baths prepared with a so-called self-emulsifying oil has been recommended.

Recent investigations in the soaking of silk indicate also that the addition of triethanolamine increases the degree of dispersion and improves the penetrating properties of the soaking emulsion, thereby resulting in the desired gain in weight of the silk in a shorter time and with a lower concentration of oil than is possible with older methods. Mention should be made also of a new silk-soaking process in which emulsions are circulated through the silk constantly under a moderate pressure, the direction of flow being reversed occasionally to insure even penetration of the emulsifying fluid and to prevent uneven soaking.

For boiling-off delicate, fine-gauged chiffon hosiery the still-bath method which had already proved its worth for treatment of delicate woven fabrics has been adopted by hosiery dyers. Single-bath processes for delustering silk hosiery have been developed by means of which the degree of luster is readily controlled by varying the amount of delustering agent and the length of time of treatment.

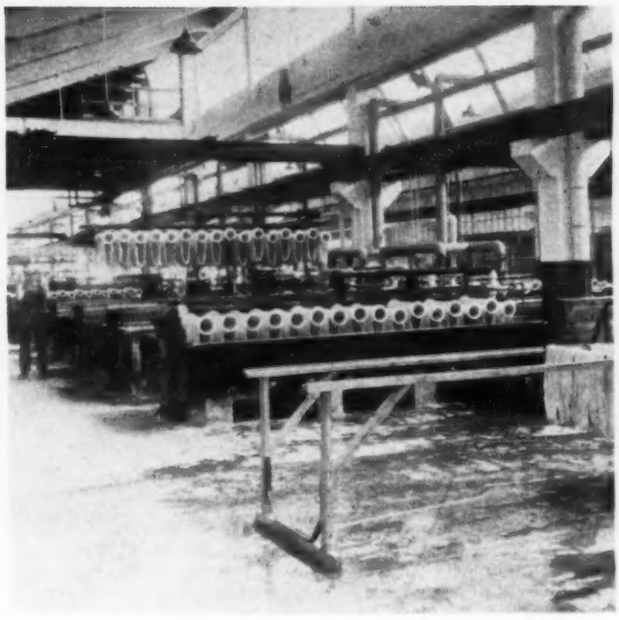
It has been established that maintenance of correct pH value is the determining factor in the removal of sericin from silk, although time, temperature, and other factors are also of importance in securing best results in silk degumming. When concentrated soap solutions having a pH value between 9.5 and 10.5 are employed at the boil, not only is removal of sericin accomplished, but the silk is weighted, giving it a body and feel of springiness, loftiness, and softness. Future developments in degumming, no doubt, will be along the line of improvement of the physical characteristics of the silk, and attempts are now being made to find other colloids which, in conjunction with acid or alkali, will yield results comparable with those obtaining with soap. In dyeing silk with acid colors in gum-soap liquor, the necessity of pH control has proved important, as it has been found that the efficacy of gum-soap liquor is due to the presence of sericin B, which is unstable in strongly acid or alkaline solutions and is completely precipitated in solutions which have a pH value of 4.

Screen printing, a new process devised to replace hand-block methods, has found some favor both in this country and in Europe. All classes of dyestuffs may be applied; and the process, which utilizes a different silk screen for each color, is much more rapid than the hand-block.

Silk and rayon finishers have borrowed from the woolen and worsted finisher the semi-decating process. Piece goods treated by means of the semi-decator are said to drape better; to feel softer, heavier, and more silky; and to resist distortion or cockling due to atmospheric changes. For this reason, and since pleasing novelty finishes of various types (such as twill effects) can be imparted by semi-decatizing, it is probable that 1931 will witness more general adoption of the process.

Processing Synthetic Fibers

In general, methods for bleaching, dyeing, and finishing synthetic fiber have been brought on a par with those employed for processing other textiles. More extensive production of acetate yarn, introduction of new fabrics, and increased use of staple fiber will no doubt raise new problems. Continuation of the progress begun some time ago is apparent in delustering, weighting, mercerizing, and other finishing processes. Two of the more recent developments of importance are the iron-proofing of acetate yarns and wrinkle-proofing of rayon fabrics. Iron-proofing is effected either by a modification of the usual silk-weighting process; or, more simply, by giving the yarn or fabric a superficial saponification by padding it through a cold solution of caustic soda to which alcohol or another swelling agent may be added. This treatment coats the acetate-cellulose filaments with a layer of regenerated cellulose, thereby enabling them better to withstand hot ironing.



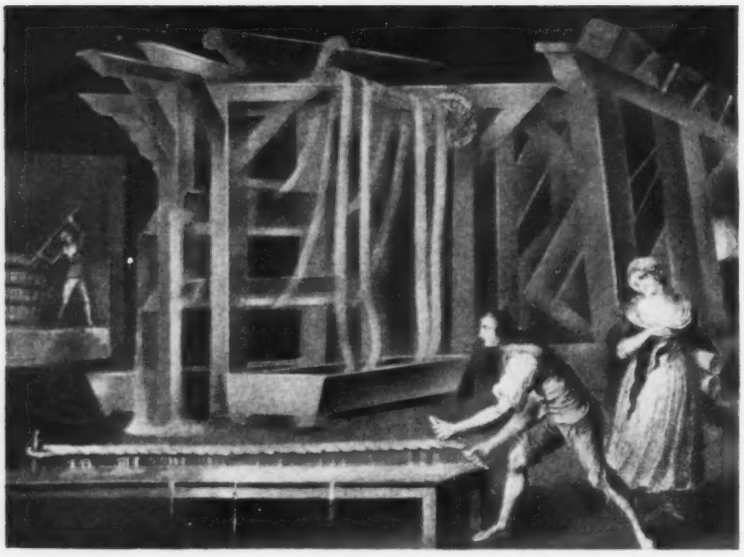
Continued progress has been made in dyeing, weighting, and delustering rayon.

The tendency of rayon to wrinkle or crease, which is due largely to its low elasticity, is now overcome by avoiding undue tension in processing and by obtaining the maximum practicable shrinkage of the yarn. In fact, stretching has been shown to be an important factor in the processing of rayon, affecting not only resistance to creasing, but also the affinity for dyestuffs, luster, and softness of the yarn. In the light of this discovery it has been shown that even dyeing of rayon is promoted by scouring rayon fabrics in rope form, with no tension.

Methods of printing fast colors on rayon crepes and similar fabrics follow much the same procedure as is used in cotton printing, but certain refinements necessary to secure best results have been made during the last year. Discharge printing of fabrics containing acetate yarn progressed considerably in 1930, and it is now possible to do discharge printing on even black and navy grounds.

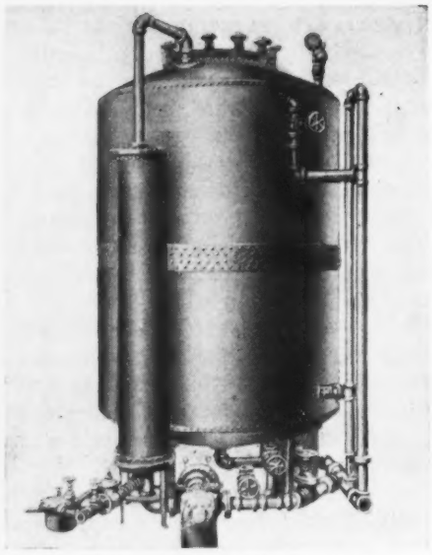
Among the many chemicals for wet processing which have appeared recently are several of more than passing interest. These include various organic solvents used to increase the solubility of dyestuffs, to form stable emulsions, and to dissolve oils, fats, and waxes. There are also a new wool lubricant featured for its hygroscopic property and its easy washability, a water-soluble cellulose product for use in preparing printing pastes, and several re-odorizing compounds.

Other products announced recently are mineral-oil sulfonates, an improved mordant for basic colors, water-soluble resins, and sizing compounds for rayon and acetate yarn. Finally should be mentioned silk-soaking oils of the self-emulsifying type, rayon oils for treatment of rayon filling and warps, improved spotting agents, delustering compounds suitable for use in the one-bath method, and wetting-out and dispersing agents.



From "A History of Bleaching," S. H. Higgins

Until the latter part of the 18th century the process of bleaching piece goods often required a period of weeks. Introduction of chlorine as a bleaching agent and development of a better technique lessened the time to days.



Boiling cotton fabrics with caustic in pressure kiers takes some eighteen hours. If peroxide is used, however, further bleaching is unnecessary, and time is saved.

Thus far, developments have been confined mainly to mechanical improvements.

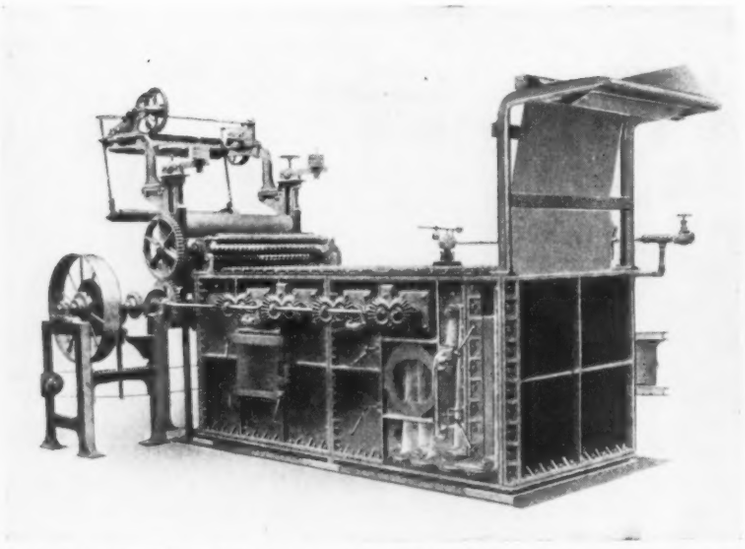
Continuous Bleaching

By Winn W. Chase

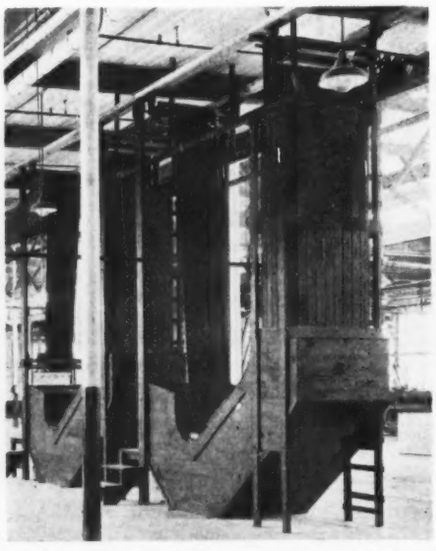
ADVANTAGES of continuous bleaching require no reiteration. Gradual evolution of bleaching methods and recent machinery developments which make it possible to process a fairly wide range of cotton piece goods are pictured herewith. Further progress rests with the chemist.

Caustic soda, chlorine, and peroxide are the chemicals most used in cotton bleaching; yet the optimum conditions of time, temperature, and concentration at which any one of them should be employed are unknown. Even less understood are the properties and reactions of other bleaching agents. Since rapidity is essential to continuous bleaching, this knowledge—important in the past—is now imperative.

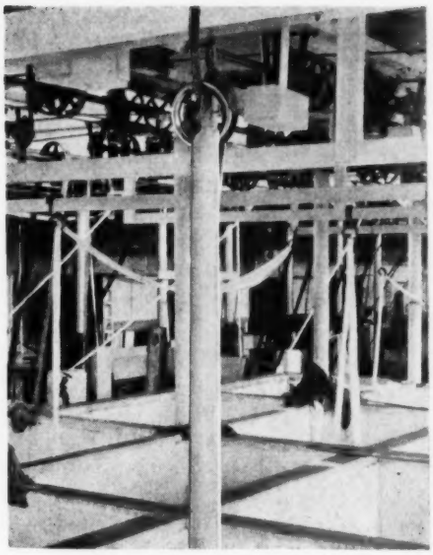
Intensive research would yield solutions to the comparatively simple problems involved in bleaching. Whether in the end chemicals



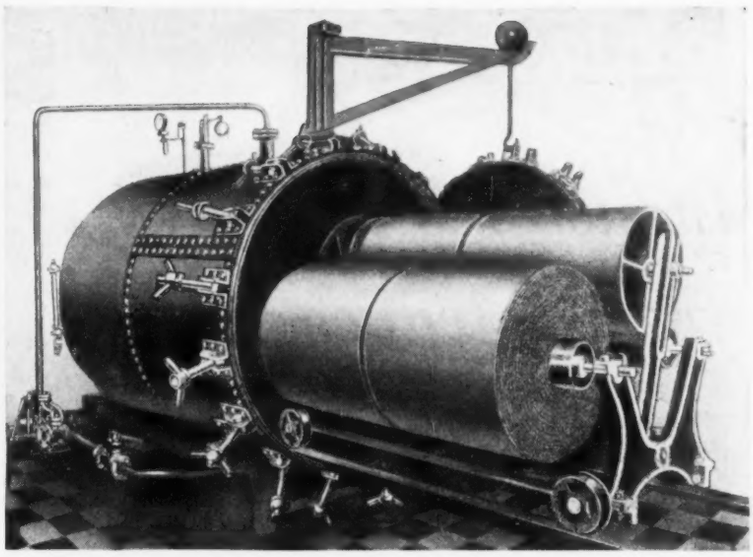
One of the several methods of continuous bleaching brought out in Europe is the Edmeston-Bentz. Piece goods, either in rope form or in open width, pass through the kier at the rate of some 2,000 yd. per hour, and are subjected alternately to the action of boiling liquor and live steam.



Used in conjunction with conventional form of kiers or with kiers of the J-box type, the Gantt piler has done much to further the progress of continuous bleaching.



After it has been saturated with chemic, cloth is piled in bins, allowed to lie several hours, washed, and again piled in other bins.



A unique feature of the Jackson open-width kier is that boiling alkaline solution is forced through the goods as they are transferred automatically from one batch roller to the other. In this equipment, depending on the weight of the fabric, about 4,000 yd. of cloth can be treated in two hours.

Challenges the Chemist

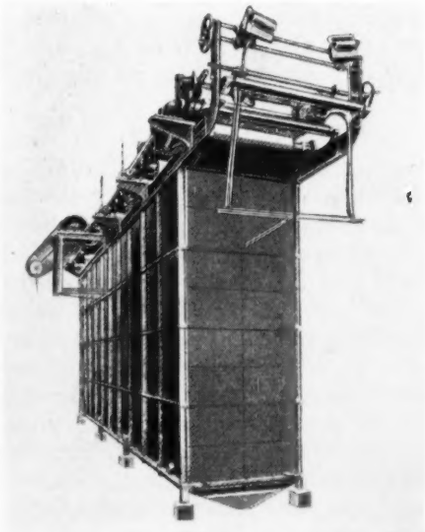
Assistant Editor, TEXTILE WORLD

other than caustic and chemic would prove most efficacious, and whether boiling out and bleaching would remain separate treatments or be combined as one, are matters of conjecture.

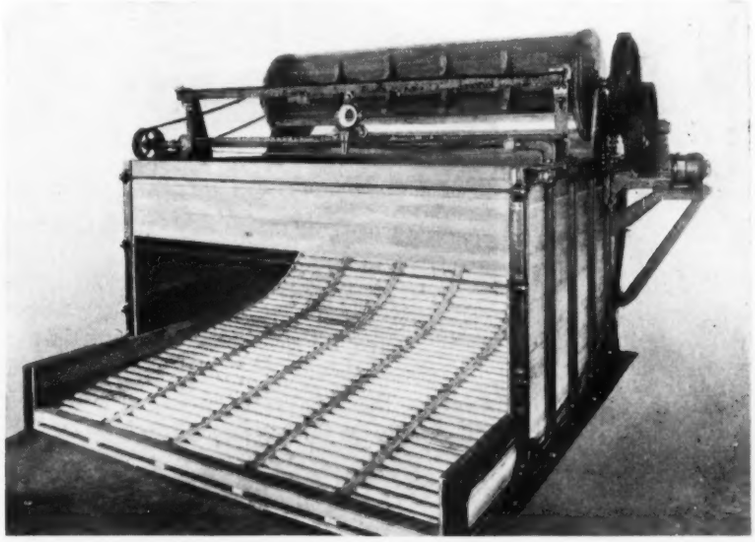
Certain it is that the action of organic solvents, both alone and with alkalis, on cotton waxes, fats, and pectins, gives room for study. Use of ozone is a possibility. Employment of a catalyst in conjunction with peroxide or hypochlorite is another. Carbon dioxide as an aid to bleaching never has been thoroughly investigated. Time and again gaseous chlorine has been tried, but always in a half-hearted, unscientific way.

Machinery builders have provided equipment which virtually eliminates the mechanical impediments to continuous bleaching. Let the chemist now evolve methods of treatment which will enable use of these machines to their fullest extent.

Future progress in continuous bleaching depends largely on chemical research.

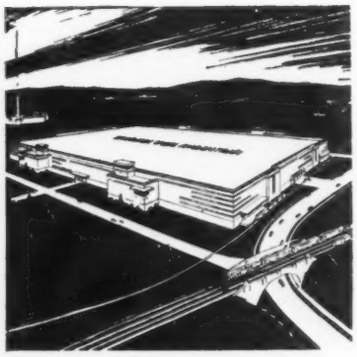


The Butterworth continuous kier operates at a speed of 25 to 40 yd. per min. and handles goods of various weights and constructions in rope form or in open width.



One of the latest developments in the Rodney Hunt slack-loop method of bleaching is an improved type of oxidizer designed to eliminate the necessity of piling goods in bins after chemicking and souring. This device aids in continuous boiling out and bleaching of a wide range of fabrics.

Industry Profits from Advances in Power Generation and Engineering



A startling innovation, which may be the mill building of the future is industry's first windowless factory, located at Fitchburg, Mass.

STEAM power plants erected during 1930 have almost all been designed with the idea of utilizing higher boiler pressures either now or eventually. In some cases new boilers have been installed to operate present turbines, while in other instances new turbines have been put in to be operated from existing boilers. In either case the operating pressure is limited by that of the unit to be retained. In all properly designed installations, however, both boilers and turbines are being purchased that will be capable of operating under 400 lb. pressure when other conditions will permit.

Double-extraction turbines are rapidly gaining in favor for textile use where much process steam is required. Taking initial steam at from 250 to 400 lb., steam is first extracted at say 100 or 125 lb. for high-pressure manufacturing use, and then low-pressure steam is taken out at 5 or 10 lb. for other purposes. If in addition to this a surface condenser is used and part of the circulating water is heated to 95 or 100° for manufacturing use, the developed power is obtained at a very low cost provided the proper charges are made to the textile departments for extracted steam and hot water.

Larger Boilers Used

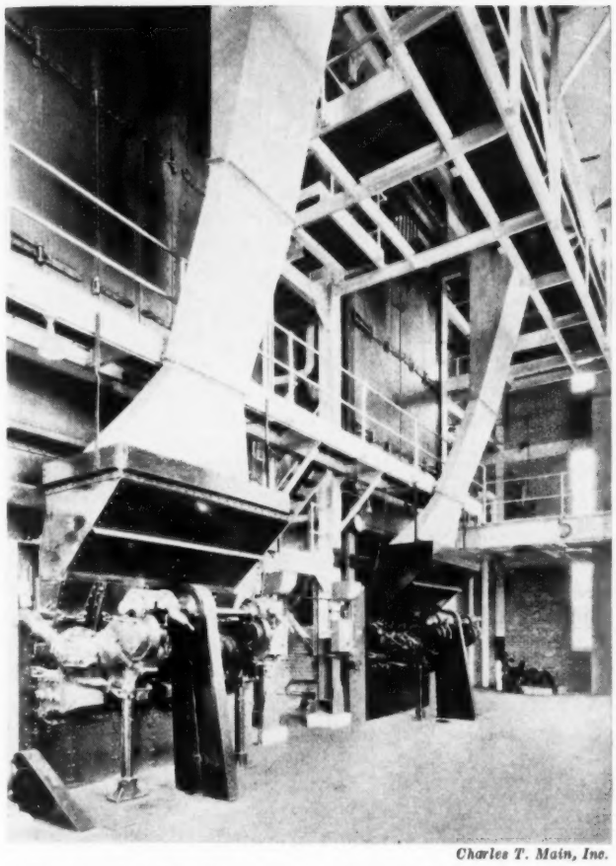
Boilers of larger sizes are being used more generally. The old ratio of 10 sq.ft. of heating surface to 1 hp. has been discarded, as it carries but little meaning today. In the days when this ratio was formulated "boiler heating surface" was all that contributed to the generation of steam. Now, in addition to this, we have the water-wall surface, the radiant superheater surface, and the preheated air—all of which increase the capacity of the boiler. Many units are regularly designed to operate at 350% rating, and there are instances of boilers running at 1,000% rating. The use of preheated air has caused more or less change in stoker design in order that the furnace parts may withstand the higher temperature of the incoming air.

Many of the newer developments in steam generation equipment are not always adapted to textile power plants. Initial costs plus accompanying higher fixed charges must be balanced against the actual economies resulting from any new installation. Expensive equipment carries larger overhead charges and additional maintenance costs. The question that the textile executive must ask is: "What is my power and steam costing me" and not "How many pounds of water am I evaporating per pound of coal, or how many heat units am I taking to generate a kilowatt?" High efficiency does not always mean low costs.

Types of Boilers

In a recent survey made by D. D. Eames (*Power*, Nov. 11, 1930) it was found that in the last two or three years in New England for all classes of plants 15,960 hp. of oil-fired boilers were installed, 33,900 hp. of stoker-fired and 22,200 hp. of pulverized coal. Included in these were ten textile plants divided as follows: four, 6007 hp., oil; four, 4902 hp., stoker; and two, 2777 hp., pulverized coal. Use of pulverized coal is rapidly increasing, although stokers are still much in favor. Pulverized-coal installations are mostly of the unit type. According to some engineers oil is not accorded very many more years of use for boiler plants. In the report just cited it is noted also that the cross-drum boiler is gaining in favor.

When high pressure steam is generated for use in steam turbines it is invariably highly superheated, this being a distinct advantage in power generation. The ex-



Charles T. Main, Inc.

Stoker-fired boilers were adopted in this modern textile-mill power plant.

tracted steam will also carry more or less superheat depending upon the pressure at which it is extracted. If direct live steam from the boilers is reduced to a lower pressure for manufacturing purposes, the reduced steam will be superheated also.

Where such steam, be it extracted or direct, is used for process work in such a manner that it comes in contact with woolen or worsted fabrics, as in steaming machines, crabbing machines, or decatizing units, great care must be taken that the cloth is not tendered by the high temperature. Saturated steam is best adapted for such processing. Manufacturers are realizing this fact, and in consequence we find that the use of de-superheaters in the various forms is increasing. Here would seem to be a fertile field for research. Just what are the limiting temperatures to which the wool fiber can be subjected both in the wet and the dry state without injury to the color, luster, strength, and wearing qualities? There is yet a wide difference in opinion on these points and a great lack of authentic data relating thereto.

High-Temperature Steam

Until recently 750° F., has been considered the maximum steam temperature advisable, but during the past year several plants have been designed to use temperatures of 850° F., and one plant in Detroit is experimenting with 1000° F. steam. Such temperatures are only usable however in super-power stations and can hardly be of interest to the textile engineer.

With higher pressures and higher temperatures comes recognition of the fact that purer feed water and purer steam must be had. It is generally admitted that by maintaining the proper sulfate-carbonate or phosphate-carbonate ratio within the boiler, all danger from caustic embrittlement can be eliminated. Phosphate treatment for boiler water seems to be gaining in favor, since it does not have some of the objections that do other methods.

From the report of the Prime Movers Committee of the N.E.L.A. we learn that improvement in the manufacture of steam turbine blades has been so marked that the outage for blade trouble in 1929 was but 18% as compared to 47% in 1925. This improvement is of great interest to textile users, because as a rule the mills do not have as ample a supply of spare units available in case of stoppage as do the public service stations. Any improvement in reducing outage means less lost time for the mills from this cause and less repair costs. Another important factor in reducing turbine-blade trouble besides that of the proper metal and proper fastening is that of clean steam. We find therefore increased use of equipment for purifying the steam either before it leaves the boiler or in the pipe lines.

Welded Boiler Drum

The welded boiler drum as a product of regular manufacture has become a reality, and will in time be accepted as the standard of boiler construction. In past reviews we have called attention to the fact that the elimination of the riveted joint in boiler drums by substituting for it the welded seam was the final and most satisfactory solution of the caustic embrittlement problem. Fusion welding has been developed until welds are now produced which are fully equal to the original plate in tensile strength, ductility, resistance to shock, and ability to stand up under repeated stress. Not only have the processes been developed to a high degree, but the finished work is subjected to a complete series of inspections and tests to prove the soundness of the welds.

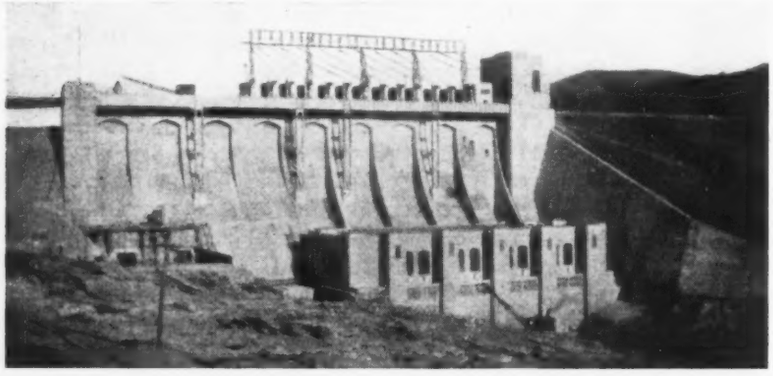
Perhaps the present status of the welded seam can be best represented by stating that the Bureau of Engineering, U. S. Navy, has just placed an order with a large boiler manufacturing concern for 24 boilers of welded-joint construction for the new scout cruisers Minneapolis, New Orleans, and Astoria. Before the welded drum can become to any extent general, however, it must be properly approved by the various code committees, and a universal standard of specifications must be drawn up and adopted in order to ensure a uniform and dependable product. It must also be approved and accepted by the boiler-insurance interests.

Fifteen-Mile Falls

Most notable among the engineering achievements in New England during 1930, and one that in the years to come will be of greater significance and of direct interest to the textile industry, was the placing in productive operation in October of the Fifteen-Mile Falls power plant of the New England Power Association. This plant is located on the upper Connecticut River in northern New Hampshire. At this place the river makes a drop of 320 ft. in 15 miles, hence the name. The present plant is the first stage in what will eventually be a 200,000 hp. development. Work was begun in August, 1928, 3,500 men were used, and the expense involved was $32,000,000. It is the largest hydro-electric plant in New England, and through its connections supplies power and light in every New England State excepting Maine. The New England Power Association is one of the principal units of the International Hydro-Electric System, and with plants in operation or under construction in the United States and Canada will control

over 1,000,000 hp. Added to this the New England Power Association has steam-operated plants totalling 472,000 hp.

The textile industry's interest in this new plant lies in the fact that the power feeders from the Fifteen-Mile Falls station run direct in two circuits to Tewksbury, Mass., a distance of 126 miles. This switching and distributing station lies between Lowell and Lawrence, and thus is adjacent to the great textile centers of eastern Massachusetts. From there the lines are tied in with Millbury, thus supplying the Blackstone Valley and Rhode Island, and also southeastern Massachusetts, including Fall River and New Bedford. For example, in Lawrence, Mass., the Lawrence Gas & Electric Co., a member of the New England Power Association, is operating only one turbine as a standby unit, the main city demand being supplied from the Tewksbury station. For the last several years an intensive campaign has been carried on in eastern New England to the end of inducing the mills to purchase their power rather than to generate it. Considerable success has resulted, particularly in those mills which do not require process steam.



Placing in operation of the Fifteen-Mile Falls power plant is of direct interest to textile mills in New England.

It will be seen therefore that in the future much of the power taken by textile plants may come from this new station in northern New Hampshire.

A startling innovation in factory building construction, while not of a textile mill is the construction in Fitchburg, Mass., of the first windowless factory. This is being built for a well-known saw and steel company. The structure will cost $1,500,000, and the walls and roof will be without windows or skylights. Uniform artificial lighting will be supplied by 1,000-watt lamps, temperatures and humidities will be accurately controlled, and the air will be changed every ten minutes. Temperatures from 5 to 10° lower than the outside air will be maintained. Blue, green, and white will be used for the colors of the walls and ceilings, and orange for the machinery. Machines will be mounted on cork pads to eliminate vibration and sound. Two shifts will be worked, from 5 a.m. to 2 p.m., and from 2 p.m. to 11 p.m. It is expected that an increase of efficiency of 33% will be the result of this unique construction.

Use of nickel-chromium steel in its various forms, known as Nirosta, Rezistal, and Allegheny Metal (all associated with the original Krupp patent product), is rapidly increasing in textile mills. This metal is stainless and rustless, and thus is admirably adapted for lining dyekettles and cloth-washers, or even the entire bodies; in pipe and tube form for use as heating coils in such kettles and washers; and for the fabrication of dippers, pails, and strainers for dyes and textile chemicals. It is highly resistant to the majority of chemical solutions used in the mills, and in addition it seems to have less effect in altering the delicate colors and shades than do some of the other stainless metals.

V-Belt Drive

Since the introduction a few years ago of the multi-V drive, it has steadily gained in favor—particularly for transmission of power from motor to machine—and the last year has seen a number of new and highly developed forms of this driving material. Much research has been carried on jointly by the belt manufacturer and the machine builder to produce the improved article. In many instances this drive is supplanting other types, especially for drives with short centers. Among the advantages claimed are the transmission of a high percentage of applied power, high pulley ratios, short drive centers, elimination of idlers, reversibility, and low maintenance costs. Many machinery and equipment builders are standardizing this drive for their products.

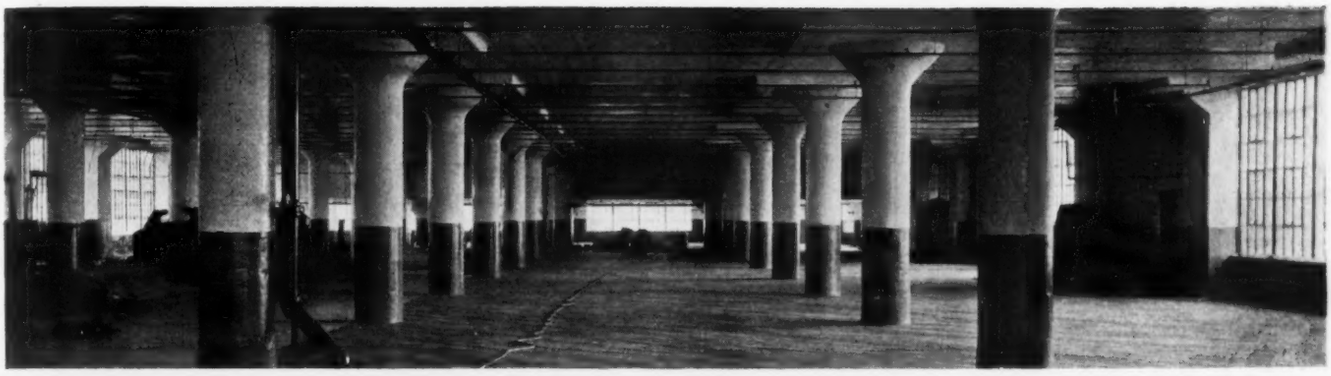
Introduction of the stroboscope has opened up a wide field for observation and study, not only along lines of engineering but also of textile manufacturing. Briefly, the idea is that by mechanical means rapid forms of motion, whether rotary, reciprocating, or otherwise, can be observed and studied as if stationary.

In textile work an important use of the instrument has been to determine spindle speeds, both on spinning and twisting frames, and to observe the amount, cause, and effect of speed variations. Spindles are invariably driven by some form of band or tape, in many ways an unsatisfactory and varying type of transmission. Soft and uneven yarn is the result of varying speeds, but up to now there has been no satisfactory means of studying this condition. Now this is all changed. One worsted yarn superintendent went so far as to state that in two weeks of observation with the stroboscope he had learned more about the causes of and the means of preventing bad yarn than in 25 years of previous work at this trade.

It is known that any attempt to determine the speed of a spindle by contact adds sufficient resistance to give a false reading. With this device there is no contact, and the speed of the spindle can be determined from the indicator which gives the speed of the instrument. It would seem that herein lies great possibilities for future study of many textile problems.

Importance of the determination and control of pH values in textile processes has become much more strongly recognized during 1930. Accurate recording instruments are now available which give a continuous chart record of the pH value of a bath, solution or effluent; and acid or alkaline strengths can be determined and controlled with an accuracy hitherto unobtainable. One interesting application of this principle is for maintaining the proper acid-alkalinity value in an alum-soda water-treatment plant where the water is to be used for dyeing light shades and must be absolutely white.

Thus it is that in this and may other ways the results of pure scientific research are being applied and rendered available for the solution of textile problems, and for the determinations of the causes of many of our major troubles of the past.



ANNUAL MILL CONSTRUCTION SURVEY

Constructing *and* Equipping Future Mills

as Seen by Leading Engineers

This section of the Annual Review and Forecast Number of TEXTILE WORLD, in keeping with our policy of emphasizing the forecast angle, is devoted largely to developments in the character of mill construction that are likely to take place in the near future. The cooperation of leading engineers has been obtained, and the article which begins on this page is somewhat in the nature of a symposium presenting the opinions of experienced engineers possessing an intimate knowledge of textile mill construction—Editor.

SUPPORTING the forces of textile manufacturers in their struggle for more economical operations as a defense against severe price competition in their various markets, engineering brains have contributed in large measure to the progress of plant modernization and to the design and erection of new "low-cost" mills. Modern engineering skill, as applied in the field of textile-mill construction, has indeed attained a high degree of efficiency in recent years.

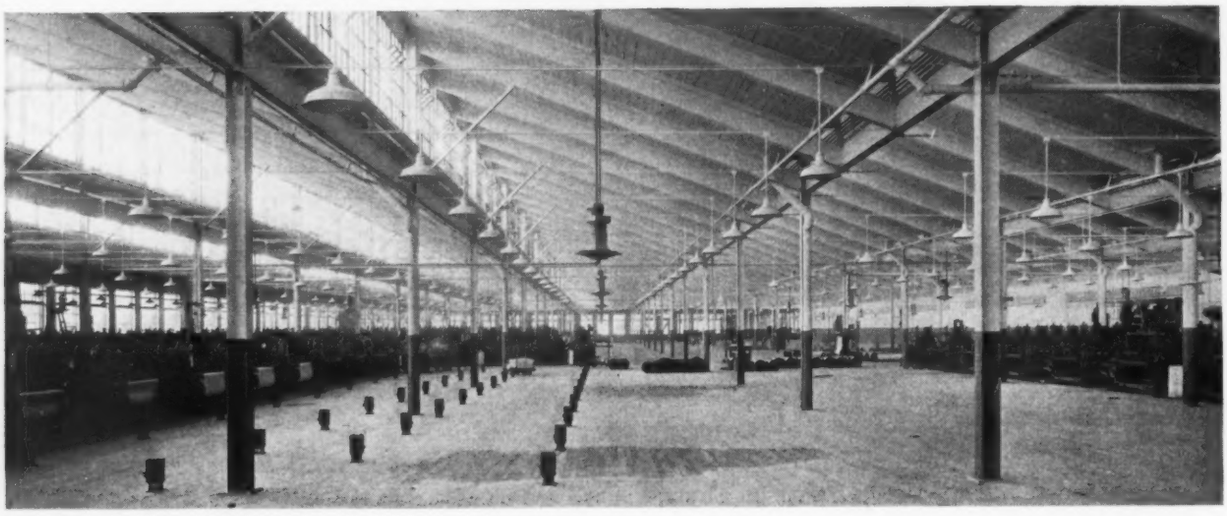
What the future holds in the character of new mill buildings and plant layouts, to some extent at least, depends upon developments in the manufacturing processes and, quite obviously, upon changes in textile-machinery design. Mill construction must be planned, in so far as local conditions permit, to provide the most satisfactory accommodations for productive equipment; not built along traditional lines and the machinery afterwards arranged to utilize available floor space. Naturally it follows that radical alterations in the shape and size of textile machines, if carried far enough, would require changes in the dimensions and general proportions of future spinning and weaving mills.

Continued Progress

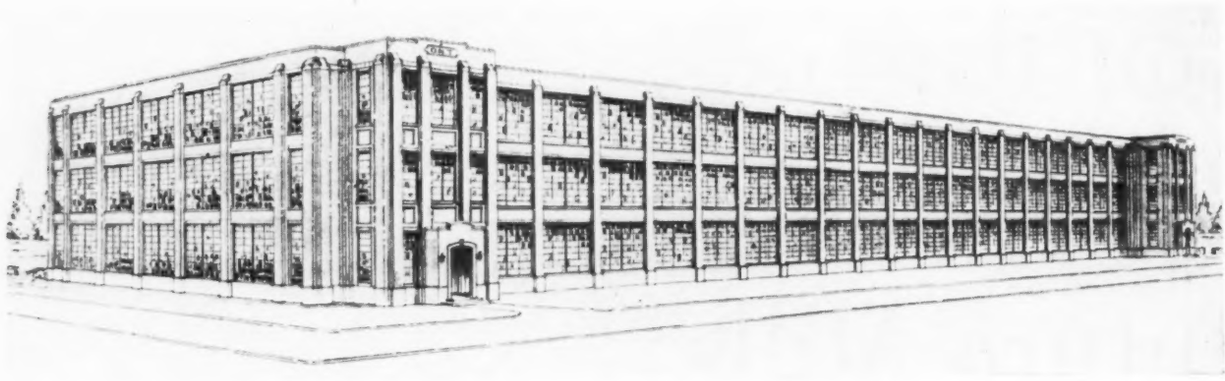
The development of better quality and new types of building materials, such as structural steels and steel window sash, of course, leads to certain modifications and improvements in the design of mill buildings. New methods in the technique of construction permit the more rapid completion of new buildings. Continued progress in this direction may be expected, though engineers do not predict any revolutionary changes for the immediate future.

"There was a very rapid change in the type of building design taking place, roughly, ten years ago," according to C. L. Emerson, vice-president of Robert & Co., Atlanta, Ga., one of several leading engineers cooperating with TEXTILE WORLD in the preparation of this article. Referring to specific changes, Mr. Emerson states: "Cast-iron columns and steel sash came into common use. Bays were extended from 8 to 11 ft. Glass area was radically increased. Ceiling heights were raised to 17 ft., and concrete came into prominence.

"These trends have continued and are still operating, but the change is not so rapid. A great improvement in details of building construction is under way. Much



Drayton Mills, Spartanburg, S. C. New weave shed. View shows saw-tooth construction, steel columns and beams, and vertical sash. Note absence of windows in wall on right-hand (south) side. (Lockwood Greene Engineers, Inc.)



Clark Thread Co., Austell, Ga. Artist's drawing showing exterior of new 40,000-spindle unit which will be erected this year. Main building measures 495 by 134 ft. (J. E. Sirrine & Co., Greenville, S. C., engineers)

of this is comprised in substituting a more permanent construction material for a less permanent one. Stairs are built of concrete rather than wood. Doorway treads and guard strips are of cast iron; wall and column footings are of concrete, rather than brick. These and many other improvements are reducing the rate of depreciation and the yearly maintenance on buildings.

Two-and-One Construction

"The general arrangement of textile plants has not radically changed, except that few high buildings—that is, over three stories—are being constructed. The trend seems definitely toward 'two-and-one' construction, which consists of a two-story spinning mill and a one-story weave shed. This arrangement is particularly advantageous for later additions, as the ends of both two-story and one-story portions can be extended as far as land permits without disturbing the basic travel of material. Even a large mill can be economically developed on a three-story plan, as the illustration of Martha Mills, a tire-cored plant, at Thomaston, Ga., shows. This plant, owned by the B. F. Goodrich Co., contains 80,000 spindles.

"The five- and six-story mills common in some sections were an outgrowth of New England practice, where land values were high and where the limitations of Corliss-engine motive power were operative. With electric power and Southern land values, all buildings would be single story, except for the greater cost of the buildings themselves and also, in very large mills, the increased difficulty of supervising such an extended travel of goods.

"More thought is being given to the architectural appearance of large plants. There is little incentive to spend a great deal of money on exterior decorations, but by proper proportions and fenestration good results can be obtained at low cost. An additional expenditure of a fraction of one per cent sometimes makes the difference between an ugly structure and one of beauty in which the management and employees may take pride." (The picture of the Rockmart (Ga.) plant of The Goodyear Tire & Rubber Co., illustrates this point.)

Visualizing the effect of scientific research on future trends in textile machinery and plant design, and injecting a somewhat different angle to the general subject of engineering developments in mill construction, J. T. Wardlaw, of Lockwood Greene Engineers, Inc., speaking for their New York, Boston, and Spartanburg offices, offered the following opinion:

"The cotton textile industry, from the standpoint of machinery and plant equipment, is now undergoing marked changes. The improvements have come rapidly

during the last few years, and the near future will, in our opinion, show even greater advance. Scientific research and awakened interest in it have gained a momentum which will undoubtedly carry the industry forward at an increased rate. A glance backwards will help us to realize this fact.

"During the period, roughly speaking, from 1895 to 1915, following the introduction of the automatic loom, cotton mills seemed to be largely standardized. Few real advances were made during that period, with the possible exception of the introduction and use of electric power in many of the mills. There seemed to be a feeling that the machinery, type of buildings, and mill equipment generally, had been pretty well perfected and that few major improvements would come. This was a period of more or less satisfied complacency as far as mill equipment was concerned, and the question of keeping mill machinery up to date was a secondary problem with mill executives.

Conditions Have Forced Improvements

"In the 15-year interval from 1915 to date, conditions changed materially. The World War brought new inventions in all lines of industry. The ups and downs (mostly downs) of the textile industry, with the keen competition of recent years, has forced attention to the question of improvements. The development of the automobile, and other less conspicuous lines, showed the public what could be done and gave the cue for scientific research. Textile-machinery manufacturers, engineers, and mill men realized that changes would and must come, and that there was opportunity for improvements in processing machinery as well as in mill buildings, auxiliary equipment, and in the housing of employees.

"For the reasons mentioned above, this latter period has been one of development, and particularly has this been the case during the past few years. We think it is safe to say that the last five years have brought greater improvements in machinery than the preceding 25 years, and also much advance in general plant design. The movement for better machinery and equipment is on the increase. The necessity for scientific research is being accepted by the industry, and results are sure to come."

With reference to developments of the last twelve months, A. W. Benoit, of Chas. T. Main, Inc., Boston, Mass., says: "Because of the comparatively small amount of mill construction or other industrial work which has taken place during 1930, it is difficult to make any statement regarding the trend of changes in types or details of industrial buildings. Much of the work which has been done consists of additions to existing buildings, and the general dimensions and details were determined by adjoining buildings.

"The condition of the textile industry at present is such as to discourage any expansion, or even making the usual replacements, and it does not seem to us at this time that there will be any large new developments in the textile industry in 1931.

"Such buildings as are constructed will probably be small additions to existing plants merely to round out the organization as it exists, and their type and construction will, no doubt, be determined by the buildings with which they are identified.

"The manufacturers whose business or financial position will allow them to do so, are reorganizing their personnel, rearranging machinery to obtain a greater labor spread, replacing obsolete machinery with modern, high capacity, better built equipment, and making some small building additions to modernize their plants as far as possible."

"As to mill buildings," according to Lockwood Greene Engineers, Inc., "there will be a more careful adaptation of types of structures and building materials to the need of the machinery and product which it houses; that is, the creation of the most suitable building, consistent with economy, for the particular process involved. This is highly important, since the layout and detail design of the building affect materially the success of the manufacturing operation.

Brick and Steel Preferred

"Generally speaking, the most satisfactory type of building so far developed for spinning and weaving mills is a combination consisting of brick walls, steel columns and beams, and wood floors. This type combines all the necessary elements for strength, adaptability for machinery layouts, low insurance rates, good floor surface for wear, comfort of operatives, and economy in cost.

"Reinforced concrete has its place, and it is particularly adaptable for wet processes, as in dyeing and finishing plants, and for heavy vibrating machinery, as in full-fashioned knitting plants; also, of course, where necessary to have absolute fireproof construction. Reinforced concrete will be used when conditions make it advisable, but we do not expect to see it as generally used for mill construction as it was several years ago.

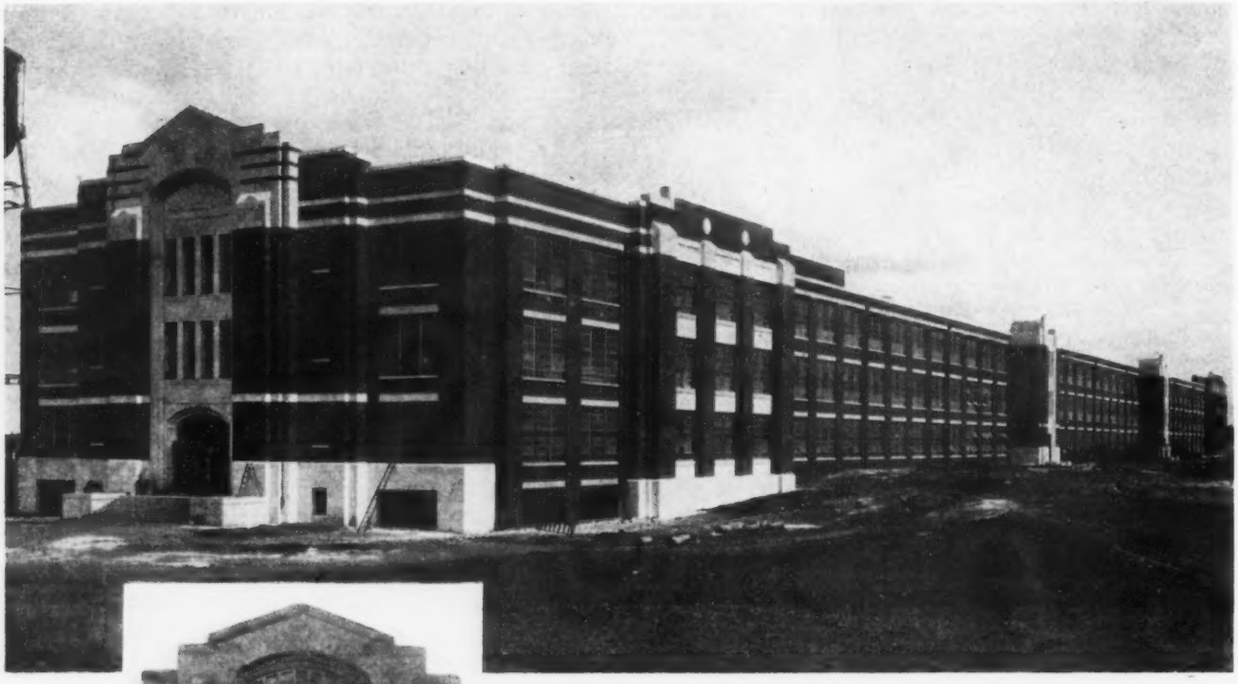
"The one-story building with monitor or saw-tooth roof, on account of better light, ventilation, and operating economy, is continuing to gain in favor; and we shall see more of this type, especially for weaving and finishing plants. While it requires a greater land area and is somewhat higher in cost than the multi-storied building, the added advantages frequently more than off-set the higher cost. For large spinning mills the multi-storied building is no doubt the best.

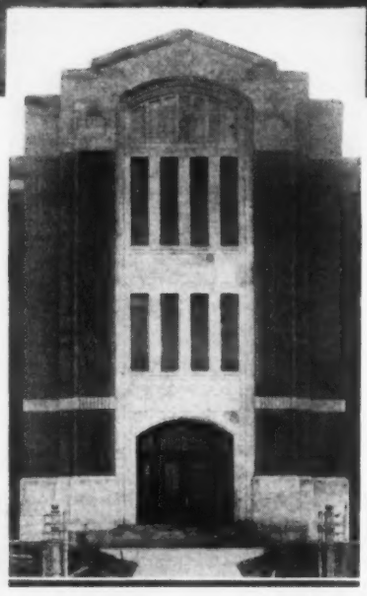
"The saw-toothed roof has long been recognized as the best type for giving good light and ventilation. For the older designs the cost was out of line and also it was difficult to obtain weather-tight construction. A recent improvement in this type in which the saw-toothed sash are placed vertical instead of on a slope, combined with the use of steel columns and beams, has greatly reduced the cost and eliminated the troubles inherent with the older designs. This gives the saw-toothed roof a standing which it did not have before, and it will no doubt be used more frequently in the future.

"Another interesting development in connection with one-story saw-toothed buildings is the elimination of side-wall windows, except on the north side. While not strictly new, this idea is now being used to great advantage, as it cuts out all direct sunlight, gives a uniform north light throughout the room, and does away with the glare from the sun, which is always so objectionable. This feature is particularly valuable in weave rooms, where it is important to have uniform humidification and temperature conditions.

More Insulating of Roofs

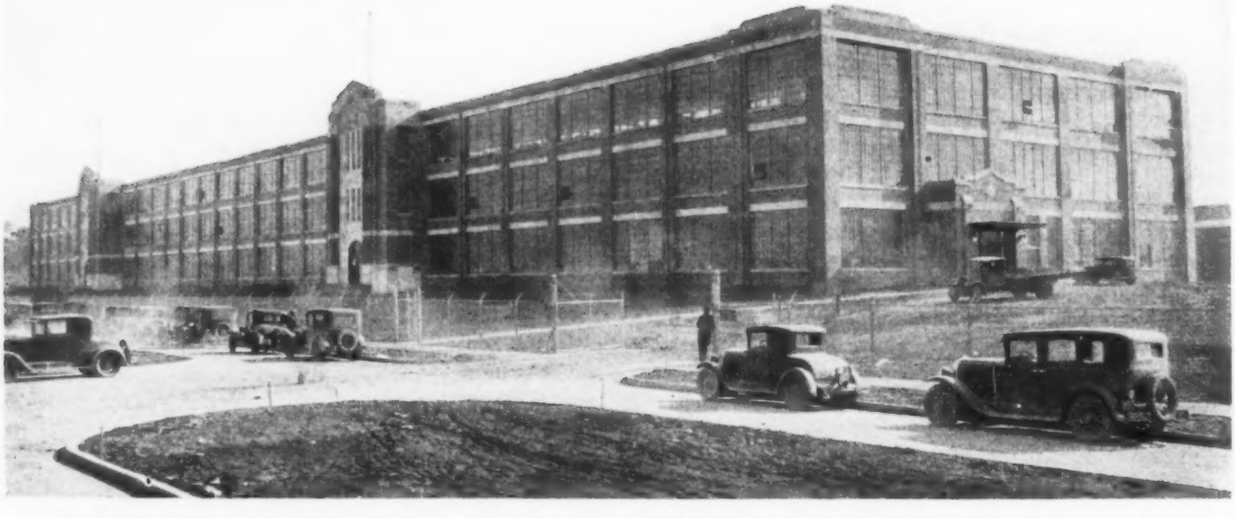
"The demand for higher humidities in a mill has made necessary certain improvements in building design. The use of roof insulation prevents condensation on ceiling





Martha Mills, Thomaston, Ga., a division of B. F. Goodrich Co. View illustrating pleasing architectural proportions and showing example of three-story construction in new 80,000-spindle mill. (Robert & Co., Inc., Atlanta, Ga., engineers)

Goodyear-Clearwater Mills, Rockmart, Ga. View showing entrance tower. Note attractive architectural features. (Robert & Co., Inc.)



Goodyear-Clearwater Mills, Rockmart, Ga. Exterior of 50,000-spindle tire-cord and tire-fabric plant recently completed for The Goodyear Tire & Rubber Co. (Robert & Co., Inc., Atlanta, Ga., engineers)

and also contributes to a better temperature control and improved working conditions in the hot summer months. We expect to see a greater use of this class of material in order to get better operating conditions and comfort for the employees."

Continuing on the subject of condensation and the problem it presents in building design, Robert & Co., Inc., states: "On account of the heavy humidities carried, particularly in weaving, much trouble has been encountered with water drip. The tendency toward roof insulation is marked. The engineers have to work with insulating materials which are either rather costly or rather inferior. It is probable that better materials will be developed, but in the meantime much is being learned about the methods of application. The sheets of insulation are being protected from moisture from below as well as from above. The large areas are being subdivided by weatherproof cut-offs, so that a failure of insulation is localized.

"Window sills are provided with condensation gutters, and these are drained and piped together and run through the wall at some convenient spot. The location of heating coils on the top floor is being more carefully studied. All these, and other design details, tend to eliminate condensation troubles."

The tendency in mill-floor specifications, as indicated by a survey of textile construction during the last five years, is decidedly favorable to one-inch maple top-flooring laid over a 3-in. vacuum creosoted-pine sub-flooring. In some cases spruce has been substituted for pine. First floors are usually laid directly on the ground and have a tar-concrete base. In certain departments of rayon plants, because of the chemical processes involved, a 2-in. mastic top floor on a concrete base has been favored. Timber for roof beams and for planking in bleach houses is more satisfactory when treated under pressure with some salt preservative. Open-joint plank floors are used around the wet machines in bleacheries.

With further reference to building design, Robert & Co., Inc., says: "Another group of changes has been brought about by the desire to provide improved working conditions for the operatives. Toilets in new mills are now entirely clean and sanitary. They are equipped with modern fixtures, separated by steel partitions. Floors are tiled and walls treated with Keene cement or tiled. The whole room can be washed down with a hose. Toilets are grouped in outside towers where windows provide both light and ventilation, nature's sanitary agents.

"Under conditions of summer heat, ice water is almost a necessity. Numerous conveniently located drinking fountains provide this service. A central refrigerating plant is usually installed, as electricity is cheap, and this system is more sanitary than that of furnishing ice to cooler boxes. Some mills are installing locker rooms and rest rooms, and nearly all of them provide a first-aid room with a nurse in attendance."

Power and Its Application

"Along with the development of better machinery," states Chas. T. Main, Inc., in discussing the question of power in the textile industry, "the use of the individual drive on textile machines has been greatly extended, so that it is now possible to buy most of the machinery thus equipped. This type of drive has made it possible to better guard the moving parts so as to reduce the hazard to the operatives.

"The further consolidations of public utilities and interconnection of systems have reduced the cost of purchased power to a point where few private plants can afford to compete, except under the most favorable conditions.

"The increasing tendency is for the plants which do not require large quantities of process steam, to purchase their power requirements and install a steam plant sufficient only for heating purposes and such process steam as is required.

"In the case of plants requiring large amounts of steam, such as finishing plants, there is a distinct tendency to modernize the steam-generating equipment. The labor saving and increased efficiency possible and, in some cases, the use of high pressures for steam so as to permit the generation of some power from steam required for process work, make this one of the most attractive fields for a progressive management to have investigated."

Referring again to industrial drives, Lockwood Greene Engineers, Inc., offers the following opinion:

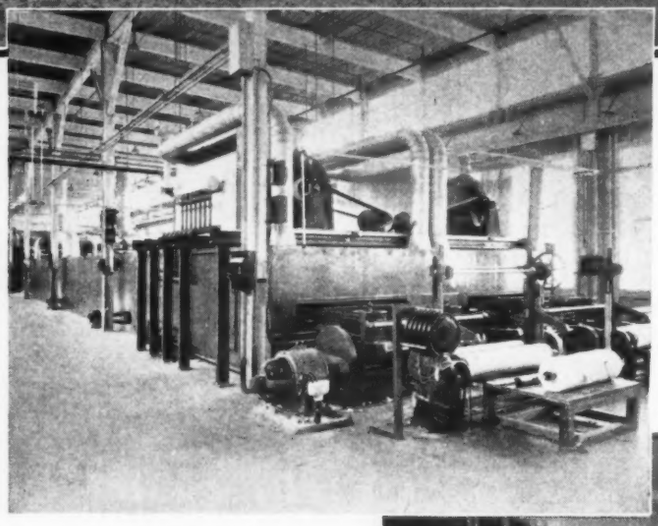
"For a new mill, the electric drive is the only source of power that would be considered today, and the use of individual motors has been established for almost every machine in the mill. Motors and other electrical equipment have been improved and are better adapted for textile-mill conditions. Much thought recently has been towards perfecting switches and controls and for the application of variable-speed motors to machines or groups of machines where more than one speed is desired. A variable-speed drive is necessary for many operations in a finishing plant and several types of a-c. and d-c. motors have been most successfully adapted

Mill Must Modernize Equipment to Compete

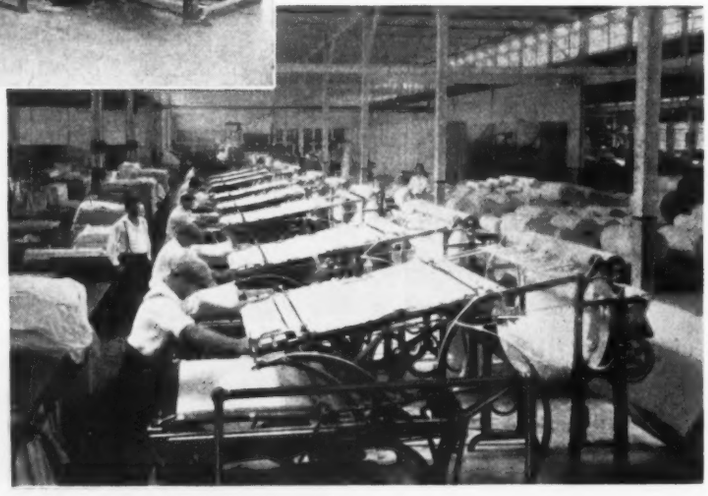
Mill buildings will probably follow present types of structure, but with careful selection of type to suit the need. The one-story building will probably gain in favor, especially with saw-toothed roof of improved design. The electric motor with positive drive stands out as the best application of power to the machines. Ventilation of our mills will receive more attention than in the past. The movement for better housing conditions will continue, but at the same time excessive or non-productive investments in mill villages will be avoided. The mill that does not modernize its equipment cannot successfully compete.

—J. T. WARDLAW
LOCKWOOD GREENE ENGINEERS, INC.
SPARTANBURG, S. C.

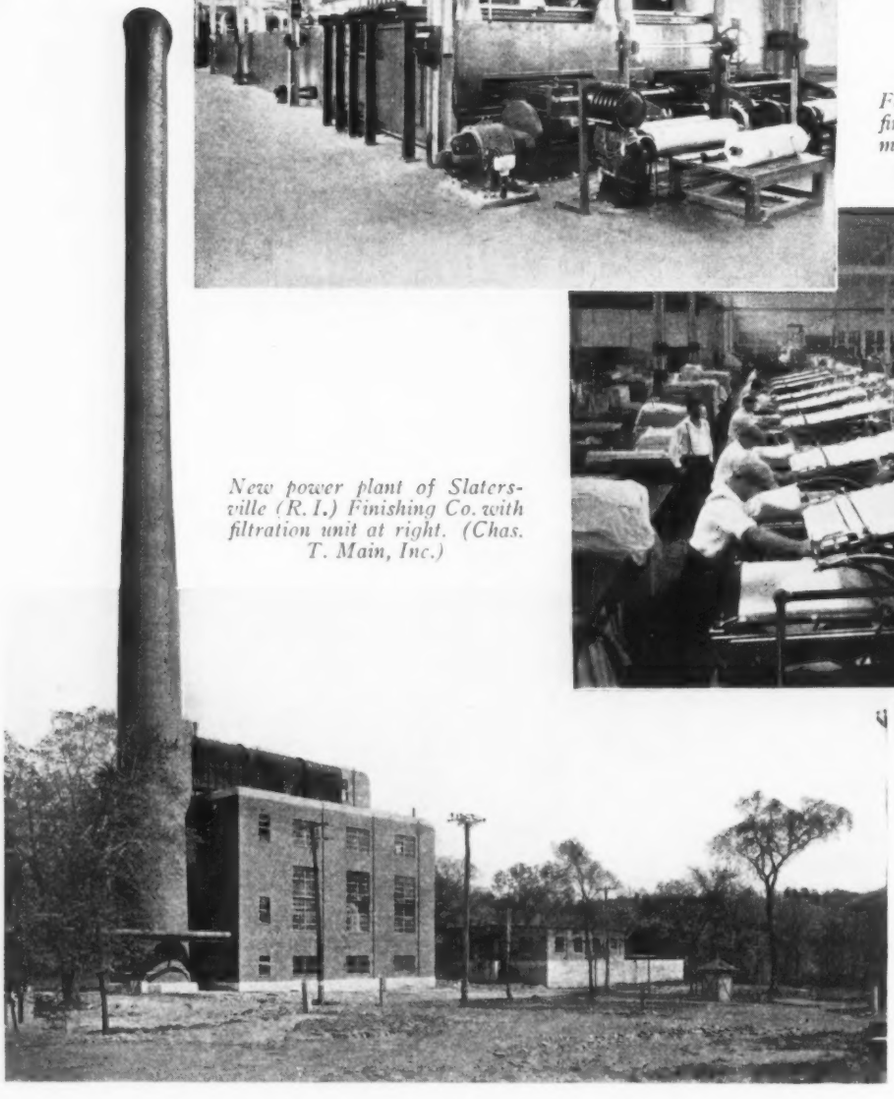
Fairforest Finishing Co.. Spartanburg, S. C. Exterior of new bleachery and finishing plant, showing one-story building with monitors. (Lockwood Greene Engineers, Inc.)



Fairforest Finishing Co., showing finishing range, variable-speed motor with controls in foreground, and good light from overhead.



Fairforest Finishing Co. Folding room, showing steel, framing and monitor roof construction.



New power plant of Slatersville (R. I.) Finishing Co. with filtration unit at right. (Chas. T. Main, Inc.)

for that purpose. The variable-speed motor is being used for driving full-fashioned hosiery machines.

"The demand for positive drives for textile machinery is constantly increasing. It is accomplished by means of gears, silent chains, or multi-V-rope drive. The V-rope drive is one of the newer developments which has great merit, since it is positive and at the same time flexible. This drive is noiseless, adaptable for any speed, easy to install, and requires very little space. A positive drive means constant speed, which is a very important feature in production."

"There is a pronounced tendency to build the driving motor into the machine itself," observes Robert & Co., Inc. "Eventually, it is probable that all motors will be furnished by the textile-machinery manufacturer as a part of his equipment. At present cards are largely group driven, and spinning and roving frames are often driven in groups of two or four by a single motor with belts direct from the motor pulley to the machine pulley. A modern mill has practically no shafting except perhaps over the cards. The small friction loss is further reduced by means of ball or roller shaft bearings and the use of V-belt or cog-belt drives from motor to head shaft.

"The modern method of supplying power is not only more efficient but also reduces the circulation of lint and fly, making conditions better for the operative. All electric services are carried in small conduit, motors have metal terminal boxes, all starters are of the dead front safety type. These and a multitude of other devices render the electrical system safe in the extreme."

"Considering the question of source of power," according to Lockwood Greene Engineers, Inc., "no hard and fast rule can be laid down, as this must be determined for each individual case. It is probable, however, that for new spinning and weaving mills it will prove as economical to buy as to generate power. Finishing plants which use large quantities of process steam and mills which already have good steam-plant facilities can usually generate their own power to advantage.

"Power-plant equipment has been greatly improved during recent years. The use of high boiler pressure, pulverized fuel, improved stoker operation, and various other items, have all contributed to make the industrial power plant of today a much more efficient and a better unit. The item of power is an important factor in manufacturing costs and warrants a careful study.

Heating, Ventilating, and Conditioning

"The most encouraging development in the line of heating, ventilating, and air conditioning is the fact that the industry has come to a better understanding of the relation of these factors and a realization of their importance to the manufacturing processes. The demand today is for a uniform product as well as for a better product. This cannot be attained without having uniform conditions in the mill. The three factors of heating, humidifying, and ventilating are closely connected and importance of their control cannot be over-emphasized.

"Automatic temperature controls are now applied successfully to mill heating systems. The development of unit heaters gives another very valuable piece of equipment, which is adaptable for many locations in the mill; and, in addition to heating, these units are also valuable as ventilating units.

"In the humidifying field, the swing has been to systems of greater capacity so as to take care of maximum rather than average conditions, also permitting a reasonable amount of room ventilation and affording some cooling effect in summer. We also note further development of control equipment for relative humidity.

"Undoubtedly more attention is being given to ventilation in our mills. This is necessary in order to obtain good working conditions for the employees, but it must be properly controlled in order not to upset the regulation of humidity and temperature. The subject of ventilation in relation to mill conditions is one which needs more study and we expect to see considerable change and improvement along this line in the near future. The central-station system stands out as a solution of the combined problem of heating, humidifying, and ventilating. Development of unit type central-station equipment bids fair to reduce installation costs."

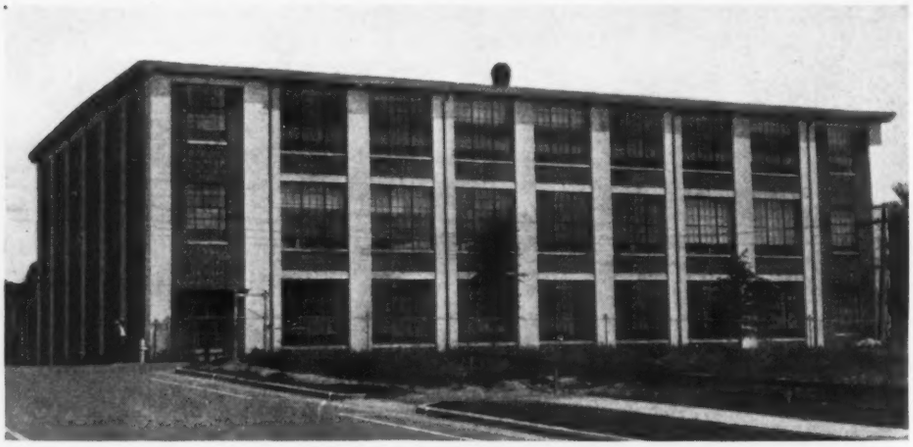
Along a somewhat similar line of reasoning, Robert & Co., Inc., states: "Heating is still mainly provided by the pipe-coil vacuum system, though unit heaters can be satisfactorily used in many rooms where there is little lint and fly. The most progressive step in mill heating has been the use of automatic temperature control. This not only pays its way on the basis of steam saved, but also prevents overheating in the winter, which is more common than underheating. Overheating is very bad for the health and efficiency of the operative.

"Engineers are looking to the future for a combined

Engineer to Aid in Modernization

There has been a definite trend in recent years toward longer spans, fewer columns, larger windows, and better facilities for employees; and such buildings as are erected will, where possible, follow along this line. Before any appreciable amount of construction work is undertaken by the textile industry, or by any other industry for that matter, the large amount of floor space now available in usable buildings, in New England and elsewhere, and for sale at very low prices, must be absorbed. The rehabilitation of these buildings for other industries will give some opportunity to modernize them partially, but the principal features, such as bay width, length of span, and story height cannot be altered. We expect to see the engineer's greatest usefulness in the next few years in modernizing plants and processes, and aiding in consolidations.

—A. W. BENOIT
CHAS. T. MAIN, INC.
BOSTON, MASS.



Knitting Dept., Wiscassett Mills Co., Albemarle, N. C. New building of reinforced concrete for full-fashioned hosiery machinery. Knitting machines on all three floors; leggers on first and third, footers second. (Lockwood Greene Engineers, Inc.)

Knitting Dept., Wiscassett Mills Co., Albemarle, N. C. Interior view. Note reinforced-concrete construction to prevent vibration; also air ducts for central-station system of heating and humidifying. (Lockwood Greene Engineers, Inc.)

Goodyear-Clearwater Mills, Rockmart, Ga. Type of operatives' cottage, gunite-sprayed walls, concrete steps, and asbestos-shingles. (Robert & Co., Inc.)

The Kendall Co., Addison Mills, Edgefield, S. C. Operatives' houses, brick with concrete steps and asbestos shingles. (Lockwood Greene Engineers, Inc.)

Joanna Cotton Mills, Goldville, S. C. Operatives' houses, showing variety in design. (Lockwood Greene Engineers, Inc.)

Days of Hit-or-Miss Operation Are Gone

Science will increasingly find its way into the textile business through the door of research. The old days of hit-or-miss operation and results achieved by main strength and awkwardness are definitely behind us. In a race for the survival of the fittest we cannot muddle through. There is an increasing realization that labor properly trained and given proper incentives can accomplish a great deal more than it has in the past. Any effort made to provide better living and working conditions for operatives is well rewarded.

—C. L. EMERSON
ROBERT & CO., INC.
ATLANTA, GA.

unit which will humidify continuously and will heat in the winter and cool in the summer. In other words, a unit central-station (in miniature) system which will be economical and simple in operation.

"In humidification there has been only minor changes. The high-duty-head system still dominates the field. Controls have been modified and improved in detail, but little real progress has been made. Competition as noted above may develop from the heating field, which will either result in a more efficient system or a less expensive one. Working conditions are improved in summer by the use of high-duty heads, in that considerable cooling is effected.

"Fire protection is an important feature in mill design, and the cost of an adequate protection system is a considerable item in the total. The methods of making and applying rules covering proper protection are the most unbusinesslike and unscientific encountered in any department of mill construction."

Lighting Tendencies

The tendency in industrial lighting has been more and more toward larger units of one type or another, and away from individual lighting. The desired level of illumination is calculated, rather than estimated, and we have intensities up to 12 foot-candles and more for special operations. The most satisfactory layouts today are those with units of 100 to 300 watts properly arranged to produce both localized and general illumination, with the highest intensity of light on the machines and in working alleys where needed.

"In the lighting of the mill there has been more change in the quantity than in the type of illumination," according to Robert & Co., Inc. "Incandescent lights of 150 to 200 watts on drop cords with steel enameled reflectors are still commonly used. Some experimental work is being done on the mercury vapor lamp to introduce red rays, which would make it more adaptable for general mill use. These developments may greatly change mill illumination in the future.

"The value of good lighting is becoming more apparent. Higher-speed machinery will require better artificial illumination for dark days. Naturally the greater expense for artificial illumination must pay its way in greater efficiency of operation."

Mill Villages

"Some efforts have been made to eliminate the mill village as a part of the development," according to Robert & Co., Inc., who state that "except in a few peculiar cases, this has been unsuccessful and the village is accepted as an integral and necessary part of the plan.

"Improvements in mill villages have been almost startling in their rapidity and scope. The cottages themselves have been improved remarkably. The illustration showing one of the cottages at the Rockmart (Ga.) plant of The Goodyear Tire & Rubber Co., tells better than a long description, the story of better housing. This particular cottage is of gunite sprayed on cinder concrete blocks. It does not require painting and is fire resistive. Note the concrete steps and asbestos shingle roof.

"All modern villages now have sewerage systems, water works, electricity, some street improvements, including street lights, and other improved features such as those found in any medium-priced city suburb."

"On the subject of operatives' houses," Lockwood Greene Engineers, Inc., observes that "it is gratifying to note that the standard continues to advance. Mill executives realize more than ever the value of improved housing conditions for their employees and recent developments indicate that this thought is being put into practice.

"The accompanying pictures show houses recently built which combine good material and workmanship, with variety of design. These houses are equipped with high-grade plumbing, electric light, and other conveniences, which make them attractive homes for the operatives. We expect to see more housing developments of this kind, but they will be projected on sound lines eliminating some of the extravagancies of the past."

Analysis of 1930 Mill Construction

EVEN though 1930 was a year over which some business men shed tears and some economists shed adjectives, there was a very fair degree of activity in the textile field in such normal functions as improving, remodeling and enlarging plants. Accurate comparison of this work, with previous years is difficult because a yardstick is lacking which may be applied to all branches of the industry. The mere number of enterprises involving enlargements or improvements is likely to be very misleading. It may, however, be considered some-

thing of an index of a year's activity, although it completely conceals the magnitude of the propositions involved.

At the end of 1930 TEXTILE WORLD's mill news department made a listing from its records of those mill construction items reported during the calendar year involving some worth-while change and found that the total number was about 30% under the number of items similarly collected for the calendar year of 1929. It is interesting to note how closely this figure checks with the estimate of 33⅓% shrinkage in dollar value of textile machinery sold in 1930 as compared with 1929, which was arrived at after a survey of the equipment field, details of which appear elsewhere in this issue.

Construction activities in the textile finishing industry and among silk mills actually showed to better advantage numerically in 1930 than in 1929. The wool, knitting and rayon field averaged around 35% less than 1929, while the cotton industry showed itself the most conservative of all with a considerable decrease in the extent of new construction. It must be remembered that these comparisons are arrived at through figures which cover merely numerical activity, in which one company investing a million dollars for machinery and buildings counts for only as much as another one which might invest no more than $5,000.

Construction by States

Analysis of the figures by States shows that the total construction of new mills, units, enlargements and improvements is largely concentrated in the same four States as last year. These states are as follows: Pennsylvania with 64, New Jersey with 57, North Carolina with 47, and Massachusetts with 33. This accounts for 53% of the recorded worth-while enterprises, and it is interesting to note that these same four States accounted for exactly 50% of the numerical total in 1929, although in 1929 North Carolina ranked second and New Jersey third.

During 1930, 38% of these recorded new developments occurred in the Middle Atlantic States, 26% in the Southern States and 16% in New England. This is somewhat different from the record of 1929 when 38% of the new developments occurred in the South, 31% in the Middle Atlantic States and 14% in New England. The leading States for new developments in each of the branches of the industry in 1930 follow: North Carolina in cotton, Massachusetts in wool, North Carolina and Pennsylvania tied in knit goods, New Jersey in silk, and New Jersey also in finishing. Among the far western States there was negligible activity in cotton, silk or wool mill building. There was some stir in knitting mill construction in that area, particularly in California.

Analysis by Branches of Industry

The six States leading in new cotton mill developments in 1930 are as follows in order of importance: North Carolina, Georgia, South Carolina, Rhode Island, Alabama, and Massachusetts. The building activities in this branch of the industry were principally parts of modernization programs or the results of absorption of other companies. There was a considerable number of mill liquidations during the year with the machinery sold to other mills, to dealers or left in place pending improvement in the industry. Records do not disclose the exact amount of machinery broken up during the year, but it would appear to be a comparatively small quantity. Government figures on cotton spindles in place show that this class of machinery has been reduced about 2% during the calendar year of 1930. Considering geographical areas, by far the greatest part of this rather small reduction took place in New England. There was a small increase in the number of spindles in place in the cotton growing States and an equally small decrease in States under the heading "all other."

Wool Mills Well Scattered

The six leading States as regards wool mill improvements in order of importance are: Massachusetts, Pennsylvania, Rhode Island, New Jersey, New York and North Carolina. In this field also there has been a large number of mill liquidations with a considerable amount of machinery redistributed. Government figures as appearing in the monthly bulletin of active and idle wool machinery disclose a decrease of about 6% in wool goods looms during the year with decreases in other sorts of machinery approximately as follows: Combs 2½%, worsted spindles 6%, cards 3½%, woolen spindles 3%. The reduction in wool goods machinery is about equally divided between New England and the Middle Atlantic States, and it is almost negligible in the States listed as "all other." In fact, these States record a 10% gain in worsted combs and a 5% gain in worsted spindles. The absolute numbers involved, however, are rather small.

The leading States in knitting mill developments during 1930, in order of importance, are as follows: Pennsylvania and North Carolina tied for first place, with a good lead over the others, Massachusetts, New Jersey, California, Georgia, and Wisconsin. Although there were a number of knitting mill liquidations in New York and Pennsylvania during the year these developments were much less evident in this field and were proportionately few. A good number of the new enterprises involved installation of full-fashioned hosiery machines, although there were a number of noteworthy enterprises, particularly in the South and in the West, involving large installations of circular knitting machinery. Although there are no up-to-the-minute statistics on machinery in place in the knitting industry, it would be a fair assumption that during the course of 1930 there was an increase, rather than a decrease, in this machinery.

Silk Mills Concentrated

The States of New Jersey and Pennsylvania account for so large a portion of the new silk mill developments recorded in 1930 that other States are scarcely worth listing. New York makes a poor third followed by Virginia and North Carolina. There were a number of liquidations through the year, of which Pennsylvania seemed to have the lion's share. Many of these liquidations merely mean transfer of ownership with the probability that the machinery will be continued in operation under new management. A number of rayon mills were completed during the course of 1930 and put into operation. Existing rayon mills made a number of improvements adding departments or making minor rearrangements.

When the building activities of dyeing, bleaching and finishing concerns are considered New Jersey leads the field by a wide margin. That State is followed by the following in order of importance: Massachusetts, Rhode Island, South Carolina, New York and Pennsylvania. The number of recorded liquidations in this field was proportionately small during 1930.

ANNUAL TEXTILE MARKET OUTLOOK

Mill Curtailment Offsets Cotton Price Drop

AT THE end of 1930 the price of cotton was 30% below 1913 while all farm products were 10% higher and all commodities were 15% higher, according to a New York Cotton Exchange bulletin. Reduction in the price of cotton and its manufactures has been among the most drastic seen in any commodity.

Goods and yarns have been confronted with a situation rarely met more than once in a business lifetime. That they have withstood such a situation to the extent they have is a matter of gratification. Without the cooperative steps that were taken, the condition at the end of 1930 would have been far worse. As it is a foundation has been laid which promises benefit to the industry come what may.

Cotton Future Hinges on Goods Trade

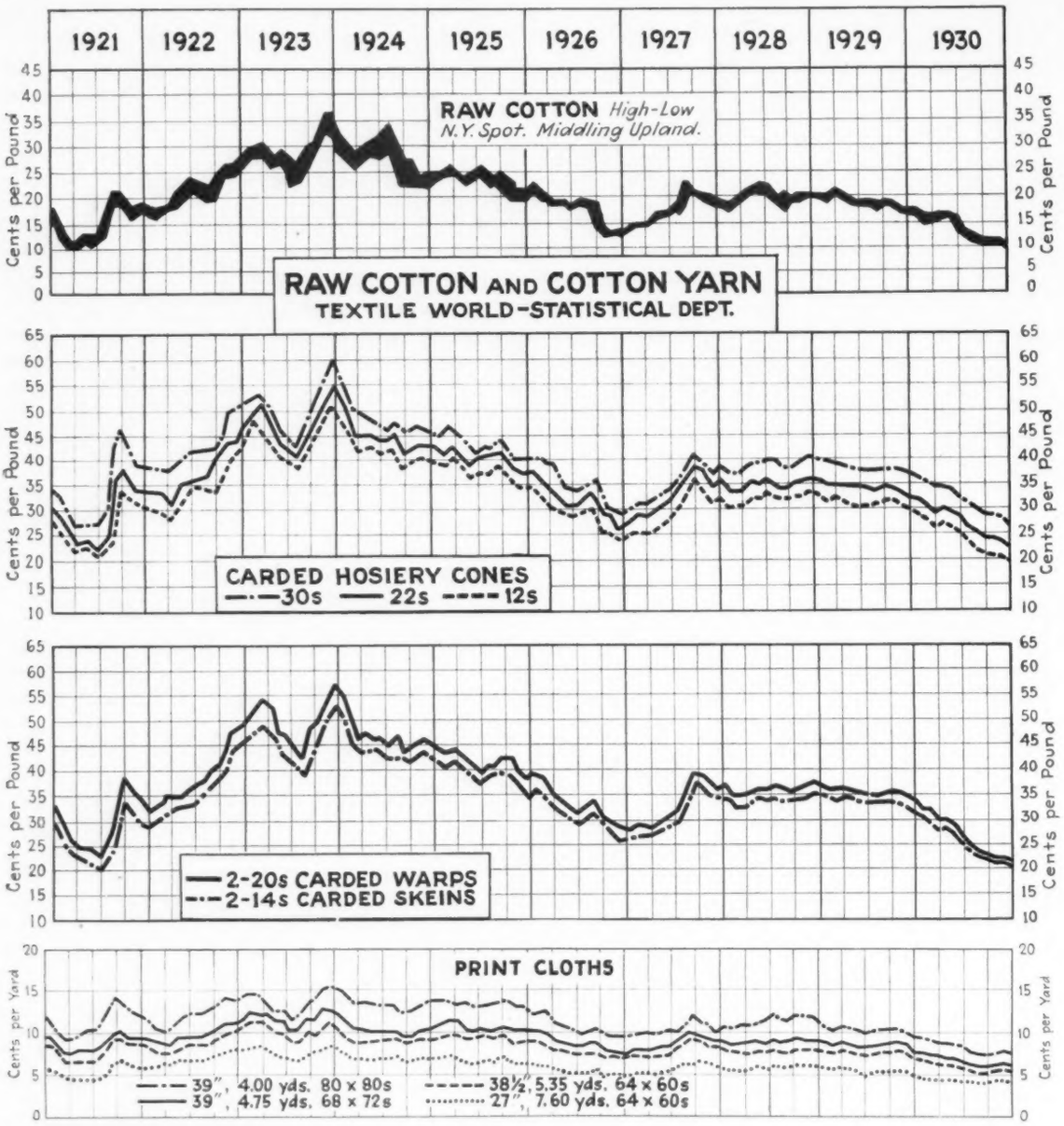
OPENING of the new year finds the cotton trade looking forward from the difficulties and losses of 1930 to the possibilities of improvement in 1931. It realizes that there are problems and perplexities still to be faced, but is hopeful that the speculative enthusiasms and overexpansion of previous years have been fully deflated, and that in the world-wide depression of 1930, a sound basis may be found for recovery during the year to come.

The extent to which cotton has shared in the general contraction of the past year may be quite briefly indicated. World's consumption of American lint cotton has dropped from an average of 15,421,000 bales for the three seasons 1926-29 to 13,023,000 bales during the season 1929-30 and a presently estimated total of about 12,500,000 bales for 1930-31; while the world's carryover has increased from about 3,270,000 bales at the beginning of August, 1926, to 6,400,000 bales at the opening of 1929-30, with a prospect that by the first of next August or the end of this season it will be up to 8,000,000 bales which would be the largest since 1921, when it was in the neighborhood of 9,250,000 and was followed by the crop failure of 1921-22. Prices, meanwhile, have declined from 17½c. for May contracts in the New York futures market at the beginning of January, 1930, to about 10¼c. at the beginning of 1931. During December futures selling around 9¼c. for near months, were at the lowest levels touched since all markets were demoralized by the shock of the World War.

It is on the extent of the decline, with its probable reactions upon next season's crop and demand, that the hope of reviving business and increasing volume of distribution (attended by increased stability, if no sensational advance in prices), must be based. There are some, particularly those inclined to trace a connection between the movement of commodity values and the supply and distribution of gold, who doubt that prices have even yet been fully deflated.

There are some others, perhaps, who would feel more confident that deflation had been complete were it not for the stabilizing operations backed by the Federal Farm Board.

It seems consequently that, whether the process has been fully completed or not, cotton has fully shared in the general deflation of commodities so far as the domestic markets are concerned, and the prevailing price is low enough as compared with all present conceptions of producing costs to result in reduction of acreage and probable curtailment in the use of fertilizer. It is still much too early for any crystallization of sentiment regarding the area likely to be planted in the South, but there can be no doubt that financial conditions as well as the low price should result in a decrease. Indeed it is probable that never before were there stronger influences working in that direction. Whether the curtailment with the assumption of an average growing season will be sufficient to insure a substantial reduction in the world's



carry-over by the end of 1931, is a question upon which the general trend of the end-season market is likely to depend most largely.

The reactions of forecasts of 1931 cotton production upon the price will, no doubt, depend largely upon the shaping up of trade conditions. In this connection it is likely that the statistical position as epitomised in the prospective carry-over at the end of this season, is more or less misleading and that it would certainly prove no serious obstacle to advancing prices should trade be seen definitely on the uptrend and should there be the threat of a small crop. This would appear to be established by the precedent of 1921-22, while it is likely that were it possible to secure accurate figures on the carry-over of cotton goods in the channels of distribution and in the possession of consumers at home and abroad, they would show a substantial falling off as compared with last year's. In other words, it is entirely probable that there has been a shifting of the carry-over from one side of the mills to the other, and that the supply of raw cotton plus the supply of goods at the end of next July would show a comparatively small increase as compared with the beginning of the present season. Nor is it believed that the world's spinners have made much provision for forward requirements of American cotton at the low prices of the season. Some buying for needs three or four years in advance was reported on the decline early in October, but this demand petered out and it is believed the trade has bought very much less ahead than in the big crop year of 1926.

Meanwhile, the cotton trade has still the existence of the Federal Farm Board and the operations of the co-operative marketing associations to reckon with. The Cotton Stabilization Corp. is credited with holding 1,300,000 bales of the 1929 crop, while the cooperatives are believed to have considerable holdings of futures, bought to replace sales out of their seasonal pools. Some think that the holdings of the stabilization corporation may be materially increased before the end of this season, although it is understood that no stabilizing operations of this sort have been undertaken by the corporation in 1930 cotton as yet.

The outcome of cooperative marketing as a farm relief measure has still to be determined. In the meantime it is hoped that nothing will be undertaken in furtherance of stabilization above the world's level, which would

destroy the usefulness of established marketing systems: until at least some idea can be formed as to the eventual success or failure of the experiment.

Group Action Needed in Cotton Yarns

COTTON yarn spinners as a group have not made the statistical progress which may be found in cotton goods. Production, although curtailed greatly during the latter months of last year, has not followed consumption as closely as in the goods field. Yet there are definite indications that spinners are now taking to heart the lessons of excessive stocks.

During a year of declining values, as drastic as seen for a decade and a half, it is natural that spinners, along with others, were confronted with enormous losses taken on all inventory carried. It is natural to believe that 1931 will see a more conservative production policy among carded and combed spinners, with the probability that by mid-year progress will be apparent and the effects felt. Until spinners have a change of heart on production policies, it is useless to expect great improvement in their spinning margins about which just complaint has been the rule during recent years culminating in 1930.

Most satisfactory progress along merchandising lines in the yarn field was made by the combed spinning mills which have enjoyed wider margins above their raw material costs than have their carded competitors. Notwithstanding this, rates of operations with combed spinners have been too small to make it possible for the average spinner to make money during the last 12 months. At least some have avoided losses and when volume returns to them fair profits will accrue. This section of the industry has been bothered by a small number of spinners who have not emerged from their old methods and still adhere to the policy of keeping plants in full time operation. Such plants took a large share of the business at profitless figures.

Similar conditions prevailed in the processing field. Mercerizers, although naming prices including fair profits based on full time operations, have been hard pressed to make ends meet because of light trade. At times many sellers became discouraged and indulged in price-cutting. It did them little good. Orders were booked in volume, but specifications improved little and sellers found themselves no better off than before prices were slashed. Notwithstanding these lapses the mercerized yarn field is one in which modern methods have been adopted and as a whole shows fundamental conditions which will lead to a fairly profitable basis when demand returns to normal. American mercerizers are to be congratulated upon the formation, and the more efficient operation during the last year, of their export association. This group was formed more than a year ago to give processors the advantages that were granted to American exporters under the Webb-Pomerene Act. Leading concerns in the mercerized field are now turning to the world markets with a united front. With the export business being guided through a central association much irresponsible selling has been eliminated, not only stabilizing prices for American processors but stabilizing conditions in those countries to which yarn exports are made. No similar coordination of effort has been attempted by carded yarn spinners. Advantage might well be taken of the large exports of American knitting machines to foreign lands, by supplying the yarns to go into these machines when operated in South America or elsewhere.

Whether spinners' margins will expand during the present year remains to be seen, but one factor in their favor and one which they are powerless to discard is the exceptionally low figure at which their raw material may be purchased. This is a factor of prime importance and may cause this year to be more profitable than several of the recent past. Losses taken during recent years on inventories and on goods before they could be shipped, will probably be less of a factor this year.

Curtailment Stabilizes Cotton Goods

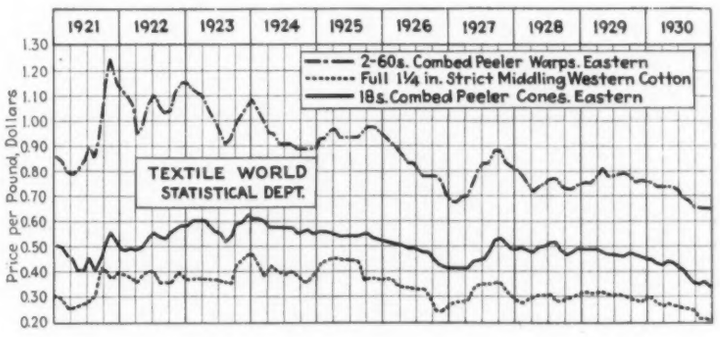
THE last year will be remembered as one of the most important in the history of cotton manufacturing in the United States. It was in that period that manufacturers for the first time kept their production in line with a declining scale of business, the first time they seriously curtailed output instead of continuing to produce in periods of slack demand.

Guidance of production in accordance with requirements of sales, was the first step the cotton manufacturing trade has taken to place this industry back upon its feet after a long period of poor business, suffered even when most other industries were still enjoying post-war prosperity. The next stage of progress will be to take full advantage of the first step and obtain fairer prices.

The battle to limit production was not easily won and all objectives have not yet been taken. The decision by a majority in the business to discontinue night work on the part of women and minors, while already a success, has yet to win a few additional converts who will probably be found in line before the year is very old. Cotton manufacturers closed 1930 in a better statistical position than at any year-end since 1926. Sales through most of the year averaged about the same level as output or less and stocks at the close of the period were relatively low.

Another development of major importance has been promotion of new uses for cotton and new style appeal for existing lines. The consumer and the retailer have been "sold" on the idea of cotton fabrics for all sorts of wear. One of the most important dress purposes is for beach and southern resort costumes.

Cotton pajamas are seen on every beach where formerly they



were conspicuous by their absence. Manufacturers have been prompt to adapt themselves to new use ideas and much credit for larger consumption is due the designers who have met all demands upon them in this respect. Textile printers and converters also come in this category, their more effective dyeing and printing of cottons being one of the outstanding developments.

Basically the situation in cotton goods has been improved by the decline in cotton during the last year. Low prices will eventually encourage volume business. Stabilization follows every period of long decline and the manufacturers find themselves adapted to the new price level before greater prosperity returns and restarts a price upswing.

In the export field cotton manufacturers have taken a progressive step by formation of a group functioning under the provisions of the Webb-Pomerene act permitting manufacturers to cooperate fully in selling abroad. It is hoped that goods manufacturers will begin to feel benefits of this in 1931. But it is being planned for success over the long pull rather than the immediate future. Instead of competing against one another in the export trade member cotton manufacturers will present a united front that will give them advantages which never prevailed previously.

Wool Industry Focuses Study on Marketing

RAW WOOL future is partly in the hands of a cooperative marketing experiment. The world supply is in excess of needs but the effect of this excess on the domestic market is not clear. Some dealers expect stronger prices by mid-year.

Decision of the woolen and worsted weaving trades to continue their cooperative effort in the Wool Institute, Inc., was one of the outstanding developments of last year. The Institute has been reorganized along different lines and the work is now going forward with enthusiasm.

For the first time worsted yarn spinners have been urged to take some action on night work. The cotton industry is setting its house in order in this respect, and many leaders in the worsted field believe control of night work will be necessary to bring production within reasonable limits.

Wool Trade Awaits Marketing Experimentation

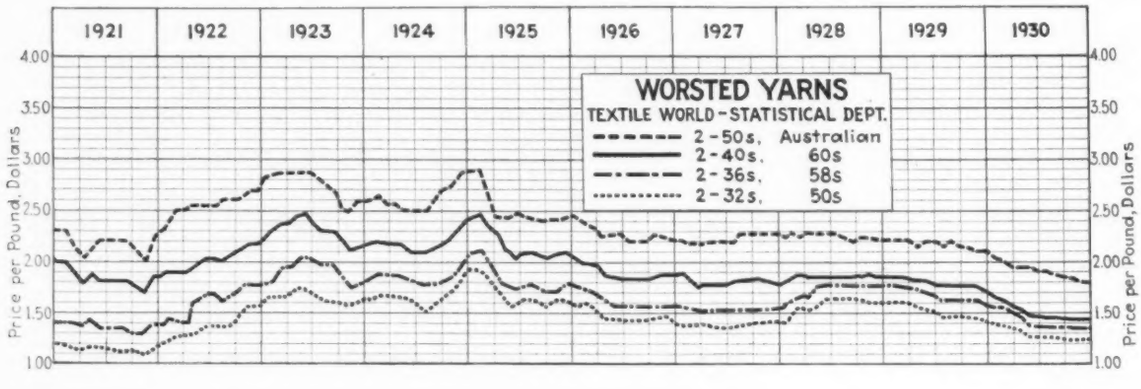
BUSINESS in wool during 1930 showed less departure from normal than did industry in general. There was a moderate decline in values and a moderate decrease in manufacturing operations. In 1930 fine wools showed larger relative consumption, foreign clothing wool making an actual gain as compared with the previous year, while the larger relative decrease for the year was in foreign carpet wools. Position of domestic wool values now seems partially established, the chief element of uncertainty in the situation being the possibility that the crossbred markets in New Zealand and South America and the merino market in Australia may not be able to pass the large quantity of unsold wool into consumption without some further decline in values.

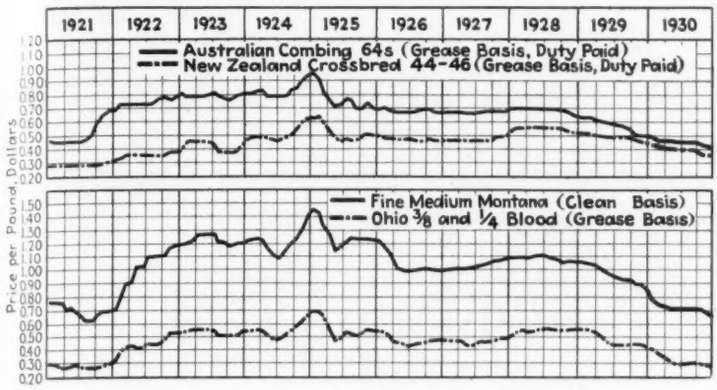
The outlook favors a gradual recovery in wool merchandising and manufacturing without any extreme fluctuations in prices, or extensive changes in manufacturing, with the woolen division of the industry in a favored position owing to extreme cheapness of raw materials available to it.

No attempt is being made to minimize the grave industrial situation reflected in wool textile circles by very cautious buying of wool at the lowest prices available. There is no excess of optimism, and yet wool dealers regard an upturn in values in the near future as not unlikely. Manufacturers are in a good position to execute any and all kinds of business. The real weakness has been in methods of cloth selling. The action of the American Woolen Co. in placing merchandising men at the head of its organization is therefore viewed with general favor.

The Wool Marketing Corp. backed by the Federal Farm Board signed up during the year about 35% of the shorn clip. The wool trade has all along had to contend with cooperative selling and the only essential difference now is that the cooperatives have been unified with a single selling agency in charge.

A recent announcement on the selling policy of the corporation is considered ambiguous by some in the trade. That "wool will be sold at values corresponding to importing parity of similar foreign wool" is clear enough.





But what does this mean?—"Also at prices which definitely make wool raised by U. S. wool growers better value to the purchasers than similar foreign wool." If the corporation is going to meet the market by selling at or a shade below importing parity of foreign wools then it would seem that the general price level at which domestic wools would be offered must be on a level determined by the foreign primary markets for similar wools. Any further decline in the Australian market will thus necessitate a further decline in domestic wool.

The new tariff on wool placing an additional 3c. clean content duty on merinos and fine crossbreds was a negligible factor during the year owing to continuous decline in foreign markets, and particularly so in low crossbreds where the new rates were 2 to 4c. below the old tariff. Higher rates in paragraph 1105 on wastes and by-products, owing to restricted U. S. mill demand and consumption, were somewhat of a dead letter. The additional 4c. on noils had no influence in checking imports of camelhair, cashmere and choice Cape noils.

The old rag market had such a severe decline last year that a change for the better may be reasonably expected. Mixed rags opened 1931 at a good stiff price, relatively too high compared with the prices at which many graded sorts were selling. Mixed rags finished the year with a relatively larger loss than any of the graded sorts. Other stocks to suffer during the year were light hoods and white knits, with more reason for a decline in knits owing to the general fall in white materials than might have been expected in the case of a valuable colored commodity such as light hoods. The decline in these grades was greatly in excess of the decline in commodities in general.

Rag dealers had a most difficult year, beaten badly by the continued drop in prices, not helped by cessation of imports; mill demand subnormal. Rag importers were little if any better off than domestic merchants. They found it impossible to sell the rags brought in under the old 7½c. duty at a profit and some of the best as well as second grade English white knits went begging at bargain prices.

New business is arriving slowly for wool wastes. There is no confident belief in any early resumption of mill buying, but it is expected that following the opening of the heavy-weight season manufacturers will begin to buy desirable materials in anticipation of cloth business. There is no disposition shown to lower values.

Woolen mill demand was on a declining scale throughout the year, while on the other hand the worsted division maintained itself with relative steadiness. The situation may be reversed in 1931.

Although the noil market had in common with the other markets an unsatisfactory year the actual decline in prices was moderate, less than the wool waste market and much smaller than the woolen rag market. The Irving Fisher 1926 index figure covering 200 commodities lost 13 points for the year, whereas on the same basis fine noils lost 12 points and quarter blood noils 16 points. Wool noils open 1931 on the low level established during 1930. Dealers are under the impression that considerable improvement may be expected as the months go by.

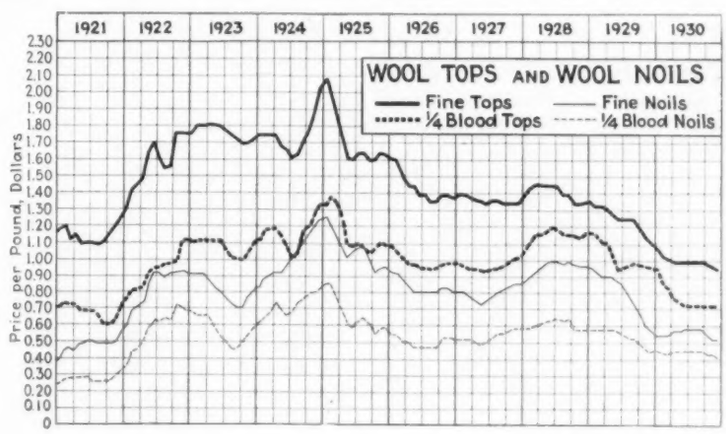
Worsted Spinners Considering Curtailment

REDUCTION in the number of English system sales yarn spindles and the plan to eliminate night work have been two outstanding developments in worsted yarn field. These will have a decided influence on the trade during the next 12 months. They are both favorable omens and give some encouragement that better things are due. Nevertheless spinners who refuse to be optimistic were more numerous at the end of 1930 than at the end of 1929.

Statistics collected during 1930 show a decided downward trend in number of English system sales spindles. French system sales spindles continue to increase, 1930 showing more in place than in 1919.

A number of large English spun yarn firms have gone out of business during the last year. The largest of these was S. B. & B. W. Fleisher, Inc., which for the time being took almost 50,000 sales spindles out of the market. Although the concern ceased business for all time, the bulk of its machinery was purchased by other sales spinners and it is not known just how much of a reduction in number of spindles occurred thereby.

Overproductive capacity of sales yarn spindles is the most serious obstacle which confronts the trade notwithstanding the progress made by English system firms. One of the main causes for this is the policy of many spinners to figure all costs and quotations on day and night runs. A mill which has 25,000 spindles operating day and night gives about the same output as 50,000 day-run spindles. Curtailment of night work or its



elimination along lines that have been followed in the cotton textile industry will be a development urged more and more.

Last year the fall in wool alone made it practically impossible for any spinner to do more than break even, as his inventory losses offset manufacturing profits. This will not be seen in 1931. With commodities at the lowest level they have touched for a decade it is not unreasonable to look for greater stability and for some sales yarn improvement this year.

Wool Mills Continue Their Institute

IN THE wool goods field the most important event has been the decision to carry on with cooperative activities of the Wool Institute. For a time, and even up to the latter months of last year, there was some reason to believe that many in the trade might discontinue to support the Institute.

One of a number of reasons for uncertainty regarding the Institute is that the woolen and worsted business is more conservative in adopting new policies than other sections of the textile industry. Disappointments had been numerous. Among these was the difficulty confronting the Institute through action by the Department of Justice. Another was the resignation of Mr. Whiteside as president of the organization.

Overcoming all these, meetings were held last December where a sufficient number of weavers gathered to make it possible to carry forward the work of the Institute along practically the same lines as heretofore.

The new type of dress goods fabrics made by both woolen and worsted mills show that the business is becoming merchandising-minded. Formerly trading had been handicapped by the mills turning out goods which they thought were the best for the public. Now they are following the example of silk manufacturers and are striving to give the public what it actually wants, not what they think it should have.

New lines that are to be worn during the present spring season will be the most attractive from style and beauty standpoint that the worsted trade has manufactured in this country. Men's wear sellers have a harder path, it seems, with popular priced goods having the edge on expensive lines.

Carpet Trade on New Level

CARPET manufacturers have passed through one of the most difficult years in their history. Falling prices, coming when consumer demand practically stopped, made the position of these mills unenviable. Carpet wool imports last year were roughly half of what they had been the previous year, which is an index of the industry's scale of production.

In the middle of the fall selling season manufacturers reduced prices of carpets and rugs 7½ to 15%. At the December showings of spring goods prices were lowered 10 to 15%. These figures indicate that at present carpet prices are approximately 40% lower than a year ago.

Sounder price level this year, with greater values offered, and the fact 1930 saw much buying and replacing of carpets postponed, give basis for expecting a better year for the efficient manufacturer.

Silk Markets Enter New Year Cautiously

CONFIDENCE plus caution sums up the sentiment of the raw silk market regarding the prospects for this year. Importers are very conservative—it would be strange if they were otherwise, considering their experiences during the last 12 months; but the undertone is strong and the outlook may be regarded as encouraging. Spring business in fabrics has not developed sufficiently at present writing, to indicate in concrete terms what the promise is for the first quarter. The situation is complicated by a lack of definite policy in Japan regarding disposal of the huge surplus stocks of raw silk now warehoused; but it may be assumed that, however these should be disposed of, their entry into the market will be gradual enough to allow of healthy assimilation.

Sensational Year Passes in Raw Silk

JAPANESE exporters and filature owners learned a grim lesson in 1930, as regards what happens to prices when supply exceeds demand, and they will not be likely to invite a duplicate experience. The year just closed was hectic on both sides of the Pacific; prices in the New York market declined steadily through the first half until mid-summer brought $2 silk in the uptown market. Innumerable broadsilk mills which had bought ahead, were badly burned; they were constantly hoping that the market had reached bottom (as was so often stated, indeed even by authorities during the slump); these mills lost so heavily in some instances that importers had to come to their rescue, to protect their own credits. Various privileges were extended; in some cases, the deliveries of the silk which was bought at "high" were protracted and duplicate orders of silk bought later at "low" were accepted, small quantities of each being shipped simultaneously, thus easing the situation.

The raw silk crisis of 1930 does not appear, when viewed in perspective, to be the fault of any trade group. True, Japan might have foreseen it somewhat, and mitigated its force by an early curtailment of production; Japan decided on such a policy finally, but too late to have any immediate benefit. However, the decline in America of consumer demand for silk products, due to the prevailing industrial recession and the tight money market, was a major influence in forcing prices down.

The growing demand for rayon was a contributing cause, though there is a tendency to overestimate this.

American importers at present are in a fairly satisfactory position, due to light stocks and a reasonably quick turnover. The slight rise which silk has registered to date has been marked by numerous recessions, but the recession usually was less than the advance; indications are that whatever further gains develop will be marked by similar doubling back.

The Japanese silk popularization campaign, due to start in July, and aiming to educate consumers to greater appreciation and wider use of silk in this country, is another constructive step.

Spun Silk Has Displayed Strength

IN THE silk yarn division, spinners fared better than throwsters, thanks partly to the stability of silk waste prices, and partly to the fine work done by the Spun Silk Research Committee, in stimulating consumer demand for spun silk fabrics. Spun yarn prices were surprisingly steady throughout the year, and there was a healthy, though perhaps not too profitable, turnover. Spinners enter 1931 satisfied with their situation on every score except that of price. Silk waste prices advanced somewhat in 1930 and the spinners could not raise their own prices, due to general conditions. At present, considering that a large percentage of spun yarn business for spring has been placed, and weavers are having difficulty in getting yarn, it seems that an upward slant in quotations is not unlikely.

Thrown silk, being more closely allied to the primary market, found that relationship a serious handicap during 1930. Thrown yarn prices did not, of course, fluctuate as greatly as did raw silk prices, but they were uncertain enough to make buyers hesitant, and this, together with the prevailing hesitancy in industry, served to slow up sales. The "boom" in grenadine-crepe yarns for hosiery manufacture helped throwsters specializing in these numbers, but the volume as a whole was small compared to the normal tram call. Broadsilk mills bought small and mostly nearby—when they did buy; yarn business during the last quarter of 1930 was far below normal, and throwsters entered 1931 in fairly hopeful mood, their attitude being, "1931 would have to be better than 1930—it couldn't be worse."

Silk Drop Hit Weavers of Broadsilks

IN BROADSILKS, the behavior of the primary market, was of course a major consideration; it brought numerous mills, among them several supposedly substantial and well known firms, into liquidation. It would be safe to say that scarcely a firm in the industry did not feel the raw silk decline, to some extent. There was a general feeling early in 1930 that the downward trend in raw silk prices would not last, and weavers bought ahead, regarding the low quotations as a bargain opportunity. It took good merchandising of the fabrics then popular, even to balance in profit, the losses on raw silk.

So far as fabric sales themselves were concerned, broadsilk mills did not suffer more than other textile groups. There was an excellent call for shantungs in the spring months, and mills carrying these lines enjoyed a good turnover. The femininity vogue, bringing longer dresses, helped the call for formal fabrics, and also helped some of the better quality shears. The price situation left much to be desired; underselling was prevalent, not only at the end of each season, but sometimes before a season was fully under way.

The fall season opened firm, and prices held steady for a few weeks; there was a good call for cantons and certain of the satins. Cantons weakened later, and the remainder of the season was marked by repeated price-cutting. Shantung advance buying for 1931 began slowly, but there is a gradual improvement.

Stability Via Cooperation Chief Rayon Need

THE opening of 1931 in the rayon industry may almost be called encouraging. There are promising signs—to date they are nothing more than signs—of the development of a cooperative spirit among producers. The London conference which brought together leaders in the world market, was a step in the right direction, but the value of the conference must be measured by results and so far there is nothing tangible.

The year 1930 offers a depressing picture in the synthetic yarn field, and it is begging the question to attribute this to the general business recession. Producers who are honest with themselves must admit that a firmer attitude as regards both rayon prices and production, was sadly needed. The decline in raw silk is a convenient carry-all for blame; and certainly, this development served to weaken the position of the finer deniers. But this was an excuse, rather than a reason for the hectic price situation which prevailed in the rayon market most of the year. As early as March, TEXTILE WORLD editorially warned the industry against continuing its vacillating price policy, and so far as subsequent developments are concerned, the editorial would be equally timely if it were republished today.

The year was a series of price cuts—and rumors of price cuts. Manufacturers soon ceased to place any faith in official assurances by producers that no cut was projected; indeed, the more jocular-minded of the consuming group came latterly to regard these statements as indicating something the precise opposite of their content. Supplementing the price cuts came special concessions and sub rosa bargains; a bedlam of ingenuous methods indirectly to undersell the market was evolved, until in the fall months it was virtually impossible to name more than one or two producers who were selling an identical denier for an identical price.

What is the outlook for 1931? Acetate yarn producers, in particular, face a serious problem, as the

output of these yarns promises to take a substantial jump, with the increased activity of the new entries in that field. The answer must be: a more intelligent attitude on production as related to sales. At the chemical end, rayon continues to make magnificent strides; but what is the advantage of improved quality and the new markets it brings rayon into, when these new markets are immediately prejudiced by a weak price policy?

The January price cut, which marked the advent of 75c. rayon, was followed by a pick-up in orders, and at moment of writing, demand is steady, though conservative. The chief significance of this latest revision is that it brings prices—for some producers, at least—within a stone's throw of production costs. However, improved business should stimulate manufacturers to exceptionally active buying, as the new levels offer opportunity for increased volume in moderate-price merchandise.

Knit Goods Must Balance Output to Sales

THE prosperity of the knit goods industries during 1930 was pro rata to the effort exerted in the respective divisions to keep production in line with demand. Perhaps the outstanding example of success in that respect is offered by the heavyweight underwear mills and of failure in that line by the full-fashioned hosiery makers.

Underwear Makes Best of Difficulties

UNDERWEAR knitters had a poor year, admittedly, but they were far from the worst sufferers in the prevailing business depression, and the comparatively firm position in which they entered 1931, was due almost entirely to a careful watch on output during the year just closed. Early in the summer of 1930, when it became clear that demand for fall underwear would be backward, producers put the brakes on production in very real fashion.

Later developments showed the wisdom of this policy. Buying through the first fall months was laggard, but stocks were so moderate, that the market held fairly steady; in November there was a healthy rush to purchase, and mills enjoyed a quick turnover, frequently finding themselves sold up for weeks ahead. Even the announcements of price cuts by important firms in December failed to jolt the market, as producers were selling heavyweights in almost exact proportions to output, and they faced the inventory period with moderate stocks. Situation of lightweight cotton, balbriggan and rayon underwear was less satisfactory from a stability standpoint, though volume was better. Rayon underwear prices were reduced frequently, most of the cuts being due to reductions in synthetic yarn prices. There was a healthy call for rayons, mostly at the low-priced end, through the mid-year period, but dollar volume was not so satisfactory, as prevalent underselling had weakened prices.

Overproduction Weakened Hosiery

THE experience of hosiery mills in 1930 was the exact opposite to that of the heavyweight underwear mills, the chief reason being that they failed to curtail sufficiently. The National Association of Hosiery & Underwear Manufacturers waged a timely and useful campaign for curtailment, as soon as the unfavorable prospects for 1930 became clear, and a certain proportion of the mills did reduce output. However, neither half-hose nor women's silk full-fashioned knitters cut their production to anything like the extent waning demand merited, and the markets passed a bad year as a result. Half-hose fared better than women's goods, but in both markets there was a flood of distress merchandise.

The full-fashioned situation was so bad in May that hosiery which cost $10.50 to produce was selling for $8.50. The situation improved in December and January, thanks to a new curtailment campaign, but the prospects for 1931 are uncertain. Full-fashioned producers are prone to be over-confident. In the fall of 1930 when economists began to forecast a business revival in spring, 1931, the mills immediately went into capacity production, and it was only with the approach of inventory-time that the danger of a glutted spring market was recognized. The extent of profitable business done in full-fashioned hosiery during the year now opening will depend largely on how close production tallies with sales. The fat years when full-fashioned silk hosiery brought rich and steady dividends without any particular effort by the producer are passed. The safeguard against a weak market in 1931 is to produce to order. Numerous of the largest and most prosperous firms recognized this at the year end, and shut down their mills for lengthy periods; but this avails little for the industry as a whole, unless the majority adopt the same policy.

Good Year Seen for Outerwear

OUTERWEAR mills passed a good year, all things considered, and the prospects for 1931 are encouraging. Business depression slackened buying of most lines, but bathing-suits held their own very well. Despite the difficulty other knit goods divisions experienced, swimsuit buying continued steady and profitable. Returns, of course, would have been better in a more normal year, but swimsuit decline did not approach that suffered by other branches of the industry. The 1931 lines were favorably, if cautiously, received when they opened last summer, and demand increased steadily; the turn of the year found swimsuit mills with a good percentage of their 1931 business already booked and some optimistic factors were talking of a possible shortage of goods in the current spring. Bathing-suit producers look to a good year, as consumers, particularly women consumers, are

thoroughly sold on the style element which necessitates one to two suits per wearer each season.

Sweater producers put in a less satisfactory year, though mills specializing on polo shirts enjoyed a quick and profitable turnover. One of the chief needs of the outerwear industry is a clearer understanding between selling agents and manufacturers regarding opening dates. At present, the market is in confusion, and this prevents 100% efficient merchandising. Taking exception to the viewpoint expressed by manufacturers at their convention last year, selling agents showed their spring 1931 sweater lines in Chicago in November; results confirmed the claims of the manufacturers and other critics that November was too early for the showing of spring lines. It is important that this year bring some permanent understanding between the two groups on opening dates.

Year of Declining Share Prices Promotes Merger Talk

A CALL for sound mergers in the textile industry goes out from financial centers South and East as the new year begins. The year lately closed was a bitter dose in most mill communities but already light beams from mill consolidations are beginning to give hope for 1931 and beyond. It is wisely said that improved conditions in the textile share market await, not a general upturn of the country's leading security boards, but evidence of fundamental improvement within the textile industry itself.

Sound Mergers a Prime Need of Textile Field

By H. J. Blackford
of A. M. Law & Co.

THE best indication of the trend of the market for textile stocks during 1930 is indicated by the high and low quotations for the year. Almost without exception the high quotations were in January and the low quotations in December with a steady decline in progress during the entire twelve months. There was no spring advance in the market, such as occurred in general market stocks.

In reviewing the year a little more in detail, quotations were fairly steady through April but there was no enthusiastic buying for there was little, if any, margin of profit for the mills on all classes of goods. Beginning with April prices began to decline steadily following the inventory losses which stockholders realized the mills were taking on cotton and goods. These losses date back to the almost unanimous feeling in the fall of 1929 that the Government had pegged the price of cotton at 16c. and hence a mill could buy a year's supply a little above that price without taking any risk. The fallacy of any confidence in the Government's operation in commodity markets has since been demonstrated with cotton and grain. A few companies hedged their cotton, but had operating losses brought about by increased cost due to curtailment and by the difficulty of selling many constructions, regardless of price. There was some activity and a little margin of profit in September and October, but these dwindled away during the last two months of the year.

The future of the textile share market is dependent upon a solution of the general problems of the industry rather than any recovery in the New York stock market.

The present depression has brought about some constructive items, such as lower costs, greater efficiency, reduction of overhead and realization that production must be carefully gauged at all times. It is also causing strong agitation for the elimination of night work. Practically no constructive work has been done as yet on sound consolidations, elimination of unprofitable units, revision of obsolete merchandising methods and to curb excessive speculation in cotton which has been the bane of the industry.

Practically no other industry purchases more than three months supply of raw materials except the textile industry. The manufacturer blames the Government for operating in cotton. The selling house claims over-production as its alibi. Sooner or later the inefficient units will be forced into liquidation by their creditors. There will be consolidations of efficient mills which will do their own finishing and converting, establishing their own brands in the trade, and in some cases carrying their production through to fabrication. Such developments are the only hope for a really satisfactory market for textile stocks.

The textile industry needs clear thinking by unselfish broad-minded men of vision. If they are not in the industry now they should be brought in from the outside.

New Bedford Passes Most Difficult Year

AFTER taking a licking through twelve round months of adversity, the majority of New Bedford's cotton mill corporations managed to retain an upright position, and were standing on both feet when the gong sounded the end of the most one-sided year most of them have ever experienced. While admitting that some of them were in a more groggy condition that ever before, some are expected eventually to profit by the buffetings.

During 1930 the list of dividend-paying stocks was reduced to 12, being one less than in 1929. The total paid out to stockholders in regular dividends was $768,590. Figured on a total capitalization of $43,722,181, this averaged approximately 1¾%. In the previous year the amount distributed was $1,069,790, or about 2.1%. Stockholders of four mill corporations in liquidation received a total of $1,169,100, with more to come at least from Acushnet and City. The other two are Manomet and Nonquitt.

The Pierce Mfg. Co. lived up to its reputation of being the most generous in distribution of regular dividends. disbursing $12 for the year.

Dartmouth paid out the largest amount to stockholders with a total of $130,000, of which $120,000 was on the

common stock. Both the common and preferred paid at the rate of 5% for the year.

Stockholders of the Bristol accepted the cash offer of the Newman interests at $39 per share. For the time being, Bristol will continue to operate and the new owners have no intention of liquidating until such time as a fair trial has been given in competing for a share of the textile business. Rumors are current that other mill corporations in New Bedford either will seriously consider liquidating, or selling out.

Despite the period of depression New Bedford is steadily increasing the manufacture of silk and rayon goods. During 1930, New Bedford used about 8,000,000 lb. of rayon yarns, and the New Bedford Rayon Co. produced 1,250,000 lb. of rayon during the year. With losses in inventory occasioned by a falling market, it was inevitable that the cotton mills would suffer a poor year. With less selling of goods below cost, and reduction in output, mill men of New Bedford look for better business during 1931.

Fall River Centers Hopes on Mergers

ALTHOUGH dividend returns from Fall River mills have been small and two more of the corporations have started liquidation, it has been the aim of mill directorates, through participation in mergers and favoring of steps to advance their financial status, to keep the city well up among the leading textile centers of the North and some progress to this end is apparent. Hope of maintaining the lead as a print cloth manufacturing center, however, was abandoned two years ago, since which time four of the print cloth mills have been closed under tax liens, another has been sold outright, three others are now in process of liquidation and the four comprising the cotton division of the American Printing Co. have been shut down since late in June.

Large mergers have been favored for the salvation of the local industry. Arkwright and Chace mills sold out to the United Merchants & Manufacturers, Inc., in 1929; King Philip and Parker mills passed to the ownership of the Berkshire Fine Spinning Associates in 1930, and the Flint mills control passed to the Newman group; the Davis mills and Lincoln Mfg. Co. were sold to the General Cotton Corp. The sale of these plants together with liquidation proceedings at Cornell mills and Union Cotton Mfg. Co., both started in 1930, reduces the Fall River owned operating plants to 14 as against 44 going concerns in 1920.

The Sagamore Mfg. Co. and Luther Mfg. Co. have been the outstanding mills for the year in that both paid 8% in dividends without materially impairing their surplus; the Algonquin Printing Co. paid an even larger dividend for the year and has a surplus of over twice the amount of its capital.

Granite mills, purchased by the Pepperell Mfg. Co. late in 1929, has been revamped into a model fine goods plant and has been operated steadily throughout the year. One of the Chace mills has been operated as finishing plant since acquisition by the United Merchants & Manufacturers and the other mill has been converted into a semi-fine goods plant, similar to the Arkwright which is also owned by the Loring organization.

Dye Industry Must Launch New Products

FACED by a smaller demand for coal-tar colors in 1930, than in the previous year, the American dyestuff industry showed no slackening in its efforts to build up a complete range of domestic colors of various classes and to select and classify those dyestuffs which are particularly suitable for specialized purposes. For example, the line of level-dyeing colors for viscose has been broadened, a group of grit-free vat dyestuffs for printing has been placed on the market, and a number of colors in powder form for dyeing acetate yarn.

In addition, the industry has strengthened its position by the consolidation of important units. As a result of the progress made thus far, manufacturers in this country are now able to supply some 90% of the total domestic needs and have developed a considerable export trade.

In view of these facts, it is regrettable that our dyestuff industry is stigmatized with a surprising want of originality. Failure to produce a variety of new products for which only a nominal demand is expected may be excused; but lack of any serious effort to develop new lines for which there is a real need, should be corrected. In Europe, the value of a far-reaching research program has been proved by the introduction of vat colors, naphthols, indigosols, dispersols, and other dyestuffs of almost equal importance.

It has been pointed out, on the other hand, that the dyestuff industry in the United States has been content to follow in the footsteps of foreign manufacturers. Extension of the demand for American dyestuffs—in fact retention of the present market—depends on the development of new products superior in quality to those now available. Since the industry as a whole shows no tendency or inclination to expend any great amount of effort on original work, the outlook for appreciable growth is not encouraging.

Dye Production and Price Trends

The accompanying table shows comparative dye production in the United States from 1917 to 1929 inclusive, and comparison with 1914. This table is based on reports of the U. S. Tariff Commission. For the first eleven months of 1930, imports of dyes were 3,807,656 lb. valued at $3,236,479, compared with 5,856,722 lb. valued at $4,902,273.00, in 1929. Data on the domestic output for 1930 are not yet available but it is estimated that, due to unfavorable conditions in the textile industry, the output fell to about 78,000,000 lb. and domestic consumption to approximately 58,750,000 lb.

	No. of Firms	Dyes Produced Lbs.	Value	Average Price Per Lb.
1914	7	6,619,729	$3,470,096	$0.37
1917	18	45,977,246	57,796,228	1.26
1918	78	58,464,446	62,026,390	1.06
1919	90	63,402,194	67,598,855	1.07
1920	82	88,263,776	95,613,740	1.08
1921	74	39,008,690	32,370,000	0.83
1922	87	64,632,187	38,779,312	0.60
1923	88	93,667,524	51,048,800	0.545
1924	78	68,679,000	37,086,660	0.54
1925	75	86,345,438	40,582,356	0.47
1926	61	87,976,624	36,950,182	0.42
1927	55	95,167,905	37,115,483	0.39
1928	53	96,625,451	40,582,689	0.42
1929	54	111,421,505	47,909,247	0.43

Summary of the Week's Developments in the Textile Markets

COTTON TEXTILE MARKETS: After the spurt in sales of cotton goods two weeks ago which was called "dumping" by many in the market, cotton goods have been less active, although a fair volume of business has been placed. Prices have been steady at the higher level reached after the forced selling had been completed. Confidence among the larger buyers is lacking. They have seen sellers force business at reductions when demand fell off and they will not place additional orders of large size until prices are cut. They have reached this frame of mind by experience and through lack of good merchandising on the part of certain print cloth sellers. Selling agents blame the mills and mills say the agents or other mills are to blame. There are indications that other sections of the market, especially fine cotton goods and sheetings, are about to experience good demand. Yarns have been dull with prices holding in view of the stability of the raw material market.

WOOL TEXTILE MARKETS

There is a good demand for spot fabrics in both the men's wear and dress goods sections. Buyers are taking practically anything that they can obtain for immediate shipment. Mills are feeling the effects of this lack of manufactured stocks and many weavers have stepped up their former rates of operation. Several dress goods firms are running day and night shifts in order to make quick deliveries. There is a good call for duplicates in the men's wear market and in dress goods spring lines are moving in large volume. A number of mills took a chance and made up stocks in conservative amounts and they are benefitting from this. Goods on which little style risk is taken are the ones that are moving, showing that while improvement is at hand no one is losing the former perspective and taking undue risks. After the early disappointment at London openings wools show a steadier tone here. Worsted yarns are more stable after the recent price reduction but no large sales are reported.

SILK TEXTILE MARKETS

Prices of raw silk are easier, but advance is looked for, due to low stocks in broadsilk mills. Moderate raw movement all week; importers are optimistic regarding February and early March. Thrown yarn prices unchanged; weavers buying steadily but lightly; hosiery knitters still slow to place business; general tone firm. Silk spinners in good position, but demand has eased; trade is hopeful of pickup in mid-month; several silk firms now spinning rayon, tying up with new demand at that end. Broadsilks are moving steadily, cutters showing interest in prints; certain print lines have been short, but production has increased and deliveries now are spot. Prices steady and outlook encouraging.

RAYON

February prospects are considered good; end-January call for 150s active and both knitters and weavers show interest; tendency toward multifilament continues. January yarn sales reported above average. Pressure for 150s has caused producers to increase output of certain of these numbers. Rayon waste continues quiet, with little real interest at any end; stocks somewhat larger. Moderate call for finer grades of spun rayon.

KNIT GOODS MARKETS

Signs of an early advance in women's full-fashioned hosiery prices, previously noted, are more pronounced; leading producers regard it as certain that further gain by raw silk will bring an increase; full-fashioned demand is good and market tone firmer. Half-hose demand good, mostly small orders for spot delivery. Underwear quiet, due to between-season situation; spot call for heavyweights practically ended, but new lines may not open for another two weeks; spring underwear fairly active; market confident. Outerwear interest centers on swimsuits, where demand is good; fall sweater lines continue sluggish, and slow pick-up is expected; spring sweaters slightly improved.

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S.T.A. Division Meets at Montgomery

The regular winter meeting of the Alabama-Mississippi-Louisiana Division of the Southern Textile Association was held at the Chamber of Commerce, Montgomery, Ala., Jan. 30. R. J. Jennings, Lanett, Ala., chairman of the division, presided and conducted the discussions on practical mill problems. (A complete report of the discussion and other details of the meeting will be published in the Feb. 14 issue of TEXTILE WORLD.)

Piedmont Chemists Hear Technical Discussion

Technical discussions on the dyeing of rayon yarns and other phases of textile chemistry featured the regular winter meeting of the Piedmont Section of the American Association of Textile Chemists and Colorists, at the O. Henry Hotel, Greensboro, N. C., Jan. 31. Samuel L. Hayes, Hartsville, S. C., chairman of the section, presided at the banquet and business session which was attended by approximately 200 members.

Hill Hunter, purchasing agent, Proximity Mfg. Co., of Greensboro, addressed the gathering of chemists and dyers on "Purchasing for Textile Mills and Some of its Commercial Aspects." (Full details of the meeting will appear in the February 14 issue of TEXTILE WORLD.)

The local committee in charge of arrangements for the meeting consisted of R. M. Mitchell, of Proximity Mfg. Co., chairman; R. W. Glenn, of the Ciba Co., and J. D. Sandridge, of the E. I. duPont de Nemours, Inc., dyestuff division, all of Greensboro.

Further Wage Adjustments in New England

Gradual realignment of wages continues in New England, particularly in the woolen and worsted divisions. A notable feature is that there has been little opposition on the part of operatives, in fact reductions have been discussed with the operatives before being put into effect in some cases. One factor which has tended to avert any trouble is that many of the lower wage schedules have been in the nature of piece-meal readjustment to competitive levels rather than flat cross-sectional cuts. There is, however, a tendency in certain quarters to fall back on the outmoded formula of blindly cutting wages to compensate for poor business.

The cotton goods industry is generally showing good sense and courage in resisting the temptation to cut. No reductions have been heard of in New Bedford and, with a few exceptions, this policy has held in New England.

Modern Textiles Contrasted With Ancient Works at Show

Modern art was revealed as a renaissance of the work of forgotten artists of more than 2,000 years ago by a comparison at a historic textile exhibition in the Home Making Center, Grand Central Palace, New York. Documented textiles, some of which have been preserved from the almost mythical Chinese and Persian civilizations, stood out in the exhibit as sharp and colorful as the creations of contemporary artists.

"Stolen Design" Exhibit Held to Aid Vestal Bill

Something new in art exhibitions was introduced to New York this week, when a display of original and stolen textile designs, opened at the Art Center. The display represented designs previously shown in the office of Senator Waterman, chairman of the Senate Patents Committee, at Washington, and played a big part in winning support for the Vestal Bill for the protection of design. This bill is now under discussion in the committee and soon will come up in the Senate for final passage. It has already passed the House of Representatives. The exhibit at the Art Center is to continue

for two weeks and is under the auspices of the League for Suppression of Industrial Piracy. Among items shown are originals and pirated copies of embroidery, upholstery fabrics, lace, dresses, and many other industrial designs.

Rayon Yarn Association Discontinues Activities

C. H. Le Roy, managing director of the Rayon Yarn Association, which has served the yarn converting trade for two years, announced the suspension of the association's activities, Jan. 31. Mr. LeRoy said changing conditions in the industry had prompted the action. Warm tribute to the work done by Mr. LeRoy in promoting the rayon converting industry and coordinating the converters' activities was paid by Royal Little, of Franklin Rayon Corp., Providence, R. I., in a statement. Mr. Little said Mr. LeRoy had been an important force in stabilizing conditions in the converting trade, during the past two years.

Standards For Terry Towels Adopted

Reducing the number of sizes of fast selvage terry towels from 96 to 6 through new standards has received the signed approval of a large enough number of manufacturers, distributors and users to ensure general adoption by the industry, according to the Bureau of Standards, under whose supervision the matter was studied. The recommended standards may become effective March 1, 1931, as agreed at the meeting of the industry. Sizes approved consist of: 16 x 30, 18 x 36, 20 x 40, 22 x 44, 24 x 46 and 24 x 48. This will not effect special orders for towels smaller than 16 x 30 or larger than 24 x 48.

Less Wool Consumed In December

The total quantity of wool going into manufacture during December, 1930, by the manufacturers reporting to the Department of Commerce was 30,007,004 lb., as compared with 31,236,612 lb. the previous month. Total for December was the smallest of 1930, the second smallest month being November. In December, 1929, there was 37,802,612 lb. consumed. Of the total consumed during December, 1930, 67.8% was domestic and 32.2% was foreign.

Japan Plans To Cut Rayon Import Tax

A tentative agreement has been reached between Japanese Government officials and rayon producers and weavers for a reduction in the import duty on rayon, according to a cablegram received in the Department of Commerce from Commercial Attaché Halleck A. Butts, Tokyo. Although nothing definite is known as to what the new duty is to be, it is understood that the extent of reduction will be minor.

N.A.C.M. Meeting Held and Amendments Passed

The semi-annual meeting of the National Association of Cotton Manufacturers was held in Boston, Jan. 30, in lieu of the usual April meeting. Purpose of the meeting was to vote on amendments to the Constitution and By-Laws, notice of which was given at the annual meeting last October, and to give notice of an additional change to be voted upon at the next meeting.

About 55 were in attendance and favorable action was taken on all recommendations. Details of the changes in Constitution and By-Laws are given in the Jan. 31, issue of TEXTILE WORLD. Most important were consolidation of the National Association with the Arkwright Club and changes in classes of members and dues. President Ward Thoron presided.

Vandam and Hampton Merge

Albert H. Vandam Co., Inc., and Hampton Co., Easthampton, Mass., have merged through an exchange of stock. This combination brings under joint control a converting sales organization and an old established finishing concern. Neither of the firms will alter their corporate style. The Vandam company will act as selling agent for the Hampton Co. Besides dyeing and printing the latter firm operates a cotton spinning plant and is also a manufacturer of rayon yarn. It is reported that the Vandam company will hereafter provide occupation for the entire finishing facilities of the Hampton Co., through its own converting departments.

New Philadelphia Wool House Formed

A new wool firm is being formed to operate in Philadelphia. Joseph C. Hance, formerly head of a concern of that name and Charles P. Boyd, connected for a number of years with Jeremiah Williams & Co., Inc., Boston, and since 1914 an active partner in that firm, have formed a company that will trade as Hance, Boyd & Co., Inc. They will handle domestic and foreign wools, scoured and in the grease, and will open office at Front & Walnut Sts.

Stevens New Los Angeles Office

J. P. Stevens & Co., Inc., New York, through B. E. Stowe, manager of the Pacific Coast office of their firm, is notifying the trade of new location of that office at 819 Santee St. (Maxfield Bldg.), Los Angeles.

"Spun-Lo," New Rayon Yarn Offered by Industrial

A new soft luster rayon yarn, which is reported to have an unusually soft supple hand, giving it an attractive draping quality, has been put on the market by Industrial Rayon Corp. The new number is known as "Spun-Lo" and for the present will be made in 150 denier, 70 filaments. Officials of Industrial said the number represented the result of months of laboratory work, and they look for it to sell to both underwear and hosiery knitters.

New Plant for Eastman Acetate Yarn

A. M. Tenney of the A. M. Tenney Associates, New York, sole distributors of Eastman acetate yarns, stated this week that the Tennessee Eastman Corp., subsidiary of the Eastman Kodak Co. of Rochester, N. Y., has announced that it will build immediately at Kingsport, Tenn., a new enlarged plant for the manufacture of Cellulose Acetate Yarns. This new plant, which is expected to be in operation by Oct. 1, will have a capacity of 2,500,000 lb. annually.

Mr. Tenney said: "The decision to build a plant at this time is in part based on the success attending the operation of this corporation's present plant and the approval of the new yarns by those manufacturers to whom we have been able to supply only a part of their requirements during the last ten months or since April, 1930. The Eastman Kodak Co. is the oldest manufacturer of cellulose acetate in the United States. Eastman research has now made available to the trade a new textile yarn made of Eastman cellulose acetate, which was developed for this particular purpose."

Forrest Bros. New Offices

Forrest Brothers, sole representatives of Bladenboro (N. C.) Cotton Mills, Vass (N. C.) Cotton Mills Co., and Forrest Mercerizing Co., Gloucester, N. J., have removed their offices from the Pennsylvania Bldg., N. W. cor. 15th and Chestnut Sts., Philadelphia, to new and larger quarters at their plant, Forrest Mercerizing Co., Essex Street and Penna. R.R., Gloucester, N. J. They will have here added facilities including warehouse, to serve their customers.

Marshall Representing Royall Cotton Mills

William C. Marshall, formerly representing the Stevens Yarn Co., Inc., in the Philadelphia section, has opened an office in the Insurance Co., of North America Bldg., 1600 Arch St., Philadelphia. Effective Feb. 1, Mr. Marshall will be in charge of sales of the Royall Cotton Mills, Wake Forrest, N. C. Royall Cotton Mills cater to the plush trade and others where uniformity in yarn is required.

Pre-Shrunk Rayon Linings Offered By Pacific

Laboratory developments by fabric experts of Pacific Mills, New York, have made possible a pre-shrunk rayon lining, which eliminates the sponging and shrinking which garment manufacturers often find necessary, it is announced. This has been achieved by the perfection of a new process.

QUOTATIONS

at close of business, Feb. 3, 1931
Prices cover average qualities unless otherwise stated

Cotton Goods

	Feb. 3	Jan. 28	Feb. 5 1930
PRINT CLOTHS			
27-in., 64x60, 7.60	3¾c.	3¾c.	4½c.
38½-in., 64x60, 5.35	5½–5¾c.	5½c.	6½–6¾c.
39-in., 68x72, 4.75	5½– 6c.	6c.	7½–7¾c.
39-in., 72x76, 4.25	6¼c.	6¼c.	8½–8¾c.
39-in., 80x80, 4.00	7½– 8c.	7½– 8c.	9–9¼c.
BROWN SHEETINGS			
36-in., 56x60, 4.00	5¾c.	5¾c.	7¾c.
36-in., 48x48, 3.00	6¼c.	6¼c.	9¾–9¾c.
37-in., 48x48, 4.00	5¼c.	5¼–5¾c.	7¼c.
PAJAMA CHECKS			
36½-in., 72x80, 4.70	5½-6c.	5¾–6c.	7¾–8c.
36½-in., 64x60, 5.75	5c.	5c.	6¼c.
MISCELLANEOUS			
Drills, 37-in., 3 yd.	6¼c.	7¼c.	10¼c.
Denims, 2.20	11¼c.	11½c.	15c.
Tickings, 8 oz.	15 c.	15 c.	19¼c.
Standard prints	7¼c.	7¼c.	9¼c.
Eastern staple ginghams, 27-in.	8 c.	8 c.	10 c.

Cotton Waste

Peeler comber	8¼— 8¾
Peeler strips	7¾— 8
Sak. comber	7¾— 8
Choice willowed fly	3¾— 4¼
Choice willowed picker	3 — 4
Sak. strips	10½—11
Linters (mill run)	2½— 3¼
White spooler (single)	6¾— 7

Cotton Yarn

CARDED (Average Quality)

Double Carded 2c.—4c. higher according to quality

SINGLE SKEINS OR TUBES (Warp Twist)

4s to 8s	– .18	22s	$0.23
10s	18 – .18½	24s	– .24
12s	.18½– .19	26s	– .25
16s	– .20	30s	– .26
20s	– .21	40s ex. qual.	– .36

TWO-PLY SKEINS AND TUBES

8s-2	$0.18½	26s-2	$0.24½
10s-2	.18½– .19	30s-2	– .25½
12s-2	– .19	36s-2	.31 – .32
14s-2	– .19½	40s-2	.33 – .34
16s-2	– .20	40s-hi.brk.	– .37
20s-2	.20½– .21	50s-2	– .41
24s-2	.23 – .23½	60s-2	– .51

SINGLE WARPS

10s	$0.18½	24s	$0.24
12s	– .19	26s	– .25
14s	– .19½	30s	– .26
16s	– .20	40s ex. qual	– .37
20s	.21 – .21½		

TWO-PLY WARPS

8s-2	$0.18½	24s-2	$0.23½
10s-2	– .19	26s-2	.24½– .25
12s-2	– .19½	30s-2	.25½– .26
14s-2	– .20	40s-2 ordin.	.34 – .34½
16s-2	20 – .20½	50s-2	– .42
20s-2	– .21	60s-2	– .52

8s-3 and 4-ply skeins and tubes; tinged, 17; white, 18; waste, 16

HOSIERY CONES (Frame Spun)

8s	18 – .18½	22s	$0.21½
10s	– .18½	24s	– .22½
12s	– .19	26s	– .23
14s	– .19½	30s tying	– .25
16s	– .20	30s reg.	– .26½
18s	– .20½	30s ex. qual.	.28½– .29
20s	– .21	40s	– .34

COMBED PEELER (Average Quality)

TWO-PLY—(Knitting Twist) Cones

20s-2	$0.34 – .35	60s-2	$0.54 – .55
30s-2	.38 – .39	70s-2	.64 – .65
36s-2	.40 – .41	80s-2	.74 – .76
40s-2	.42 – .43	90s-2	.90 – .93
50s-2	.47 – .48	100s-2	1.10 –1.15

WARPS, SKEINS AND CONES

TWO-PLY—(Warp Twist)

20s-2	$0.35	60s-2	$0.55
30s-2	– .40	70s-2	– .65
36s-2	– .41	80s-2	.75 – .77
40s-2	– .43	90s-2	.92 – .95
50s-2	– .48	100s-2	1.12 –1.17

SINGLES

12s	–$0.27½	30s	–$0.37½
14s	– .28	38s	– .40
16s	– .28½	40s	– .41
18s	– .29	50s	– .47
20s	– .30	60s	– .54
24s	– .32½	70s	– .63
28s	– .36	80s	– .73

MERCERIZED CONES—(Combed, Ungassed)

26s-2	–$0.50	90s-2	–$1.29
30s-2	– .52	100s-2	–1.59
36s-2	– .55	120s-2	–1.99
40s-2	– .58	30s	.63 – .65
45s-2	– .60	40s	.68 – .70
50s-2	– .62	50s	.75 – .77
60s-2	– .70	60s	.83 – .85
70s-2	– .82	70s	.95 – .97
80s-2	– .94	80s	1.17 –1.19

Cotton Prices and Statistics

FLUCTUATIONS OF FUTURES

	Closed Jan. 29	For Week High	For Week Low	Closed Feb. 3	Net Chge.
February	10.17	10.28	10.17	10.29	+.12
March	10.29	10.44	10.27	10.41	+.12
April	10.42	10.54	10.42	10.55	+.13
May	10.56	10.71	10.54	10.69	+.13
June	10.68	10.80	10.68	10.80	+.12
July	10.80	10.94	10.79	10.92	+.12
August	10.92	11.06	10.92	11.03	+.11
September	10.92	11.06	10.92	11.03	+.11
October	11.05	11.24	11.05	11.15	+.10
November	11.14	11.29	11.14	11.24	+.10
December	11.23	11.42	11.23	11.34	+.11
January	.....	11.39	11.38	11.39	.....

SPOT FLUCTUATIONS FOR WEEK
(Middling)

	New York	New Orleans	Liverpool
Friday, Jan. 30	10.50	10.16	5.63
Saturday, Jan. 31	10.45	10.16	5.69
Monday, Feb. 2	10.45	10.16	5.64
Tuesday, Feb. 3	10.50	10.20	5.61

FOREIGN COTTONS

Egyptian Cotton

Alexandria Exchange, Jan. 28		Change
March Sak	16.46	+0.79
February uppers	11.35	+0.40

Feb.-Mar. Shipment c. i. f. Boston.
(Tariff not included)

Fully good fair Sak	19.00
Fully good fair to good Uppers	14.12

(By Anderson, Clayton & Co.)

Foreign cottons	F. O. B. New York, Cents
Peruvian Tanguis Strict Middling	19½
Peruvian Pima No. 1	19½
Peruvian Moderate Rough	16
Peruvian Full Rough	21
China Tientsin No. 1	9½
India Rough	7 to 10
India Smooth	7 to 10

(By Gerald G. Loeb, New York.)

BASIS MIDDLING

	Saturday, Jan. 31	Saturday, Jan. 24
10 markets average	9.66	9.58
Memphis	9.15	9.15

PREMIUM STAPLES

First Sales from Factors Tables at Memphis

Grade Strict Middling	Prices Nominal
1⅛-in	11.60@11.85c.
1 3/16-in	13.30@13.55c.
1¼-in	18.00@18.25c.

CURRENT SALES

	For Week	Prev. Week	Week Before
Memphis total	15,402	12,679	12,282
F.o.b. included in total	10,428	9,349	11,575
10 markets	63,394	71,402	58,847

MEMPHIS RECEIPTS, SHIPMENTS, ETC.

	For Week	Last Year	Year Before
Net receipts	5,650	10,845	19,401
Gross receipts	23,071	30,858	54,448
Total since Aug. 1, net	559,767	794,994	670,390
Shipments	36,643	41,766	6C,267
Total since Aug. 1	802,161	1,166,549	1,108,448
Total stock	368,950	433,270	282,576
Decrease for week	13,572	508	5,819
Unsold stock in hands of Memphis factors	64,584	57,622	.....
Decrease for week	6,818	1,225	.....

AVERAGE PRICE FEB.-MAR. SHIPMENT
HARD WESTERN COTTON
F. o. b. New England

	Middling	St. Middling
1 1/16 in	12½–12¾c.	12½–12¾c.
1⅛ in	12¾–13 c.	13¼–13½c.
1 3/16 in	14½–15 c.	15½–16 c.
1¼ in	19 –21c.	20 –22c.

Basis on New York, March 10.29c.

SPOT FLUCTUATIONS AND STOCKS

Markets	Middling Jan. 28	Middling Feb. 3	Sales	Stocks This Week	Stocks Last Year
Galveston	10.10	10.25	2,830	653,458	415,943
New Orleans	10.05	10.20	6,674	771,726	512,310
Mobile	9.30	9.55	750	197,870	38,429
Savannah	9.59	9.87	1,263	322,947	68,534
Norfolk	9.88	10.00	622	95,498	73,993
New York	10.40	10.50	100	227,315	100,236
Augusta	9.56	9.69	337	114,662	100,764
Memphis	9.05	9.15	9,431	369,253	414,006
St. Louis	9.10	9.10	.....	15,543	13,304
Houston	10.05	10.15	10,158	1,422,342	1,048,817
Dallas	9.50	9.65	12,812	18,891	13,343

DIFFERENCES ON AND OFF MIDDLING

	Dallas	Memphis	Montgomery	Augusta	Average
WHITE GRADES					
M. F	.75†	1.00†	.85†	.75†	0.87†
S. G. M	.60†	.75†	.75†	.63†	.70†
G. M	.50†	.50†	.60†	.50†	.51†
S. M	.35†	.25†	.35†	.25†	.30†
S. L. M	.60*	.75*	.65*	.50*	.64*
L. M	1.35*	1.50*	1.50*	2.25*	1.43*
S. G. O.**	2.25*	1.75*	2.50*	3.50*	2.28*
G. O	3.25*	2.00*	3.50*	4.50*	3.06*
YELLOW TINGED					
G. M	0.50*	0.75*	0.50*	0.50*	0.58*
S. M	1.00*	1.25*	1.00*	1.00*	1.03*
M.**	1.75*	1.50*	1.50*	1.50*	1.58*
S. L. M	2.50*	1.75*	2.25*	2.25*	2.20*
L M.**	3.50*	2.00*	3.00*	3.00*	2.97*
YELLOW STAINED					
G. M	1.50*	1.75*	1.50*	1.50*	1.55
S. M.**	2.25*	2.00*	2.50*	2.50*	2.30
M.**	3.00*	2.50*	3.50*	3.50*	3.10
BLUE STAINED					
G. M.**	1.75*	1.50*	1.75*	1.75*	1 63*
S. M.**	2.25*	1.75*	2.75*	2.75*	2.33*
M.**	3.00*	2.25*	3.75*	3.75*	3.10*

**Grades not deliverable on contract. †On Middling
*Off Middling.

Wool

OHIO, PENNSYLVANIA AND WEST VIRGINIA
(IN GREASE)

Fine delne	$0.29 –$0.30	¾ blood	$0.26 –$0.27
Fine clthg	.23 – .24	½ blood	.25 – .26
¼ blood	.28 – .29		

TEXAS AND CALIFORNIA
(CLEAN BASIS)

Texas, 12 months	$0.63 –$0.65
California, Northern	.58 – .60

PULLED—EASTERN (CLEAN BASIS)

A.A.	$0.68 –$0.70	B-Super	$0.40 –$0.45
A-Super	.52 – .55	C-Super	.38 – .40

MONTANA, IDAHO AND WYOMING
(CLEAN BASIS)

Staple fine	$0.65 –$0.68
Staple ½ bld	.61 – .63
Fine and fine medium	.60 – .62
¾ blood	.53 – .55
½ blood	.48 – .50

MOHAIR—DOMESTIC

Best carding	$0.30 –$0.33
Best combing	.45 – .48

MOHAIR FOREIGN (IN BOND)

Turkey fair, average	$0.15 –$0.18
Cape firsts	.15 – .18

FOREIGN CLOTHING AND COMBING
(CLEAN BASIS IN BOND)

Australia:	
70s	$0.50 –$0.52
64s	.40 – .42
58s-60s	.38 – .40
(IN GREASE)	
Montevideo:	
58s-60s	$0.18 –$0.19
56s	.17 – .18
50s	.16 – .17
Buenos Aires:	
4s, 40-44s	$0.13 –$0.14
5s, 36-40s	.11 – .12

FOREIGN CARPET (GREASE BASIS IN BOND)

Aleppo	$0.20 –$0.22
China: Combing No. 1	.11 – .12
China Filling Fleece	.10 – .11
Szechuen ass't	.11 – .12
Cordova	.11 – .12
Scotch black face	.13 – .14
East India: Kandahar	.18 – .19
Vican'r	.22 – .24
Joria	.21 – .22

Worsted Yarns

ENGLISH SYSTEM WEAVING

2-20s 36s	$0.80 –0.82½
2-24s 40s	.90 – .92½
2-26s 44s	.92½ – .95
2-28s 46s	1.00 –1.02½
2-30s 48s	1.05 –1.07½
2-32s 50s	1.10 –1.12½

(Single yarns 5c. less than above)

2-36s, 58s	$1.30 –1.32½
2-40s, 60s	1.37½–1.40
2-40s, 64s	1.42½–1.45
2-50s, 66s	1.62½–1.65
2-60s, 70s	1.95 –1.97½

ENGLISH SYSTEM KNITTING

2-20s, 44s in oil	$0.80 –0.82½
2-20s, 48s in oil	.87½– .90
2-20s, 50s in oil	88 – .92½
2-20s, 56s in oil	.98 –1.02½
2-20s, 60s in oil	1.17½–1.20
2-20s, 64s in oil	–1.27½
1-15s, 46s dyed	1.00 –1.05
1-15s, 48s dyed	1.02½–1.07½
1-15s, 50s dyed	1.05 –1.10

(Oil yarns 17½c. less)

FRENCH SYSTEM

1-20s, 58s	$1.10 –1.12½
1-20s, 60s	1.15 –1.17½
1-18s, 64s, dyed	1.35 –1.40
1-26s, 64s	1.20 –1.22½
1-30s, 60s, Warp	1.25 –1.27½
1-30s, 64s, Warp	1.27½–1.30
2-30s, 64s, Fancy mixes	1.60 –1.65
2-40s, 64s, Zephyrs	1.40 –1.45
1-50s, 66s	1.55 –1.60
2-50s, 66s	1.72½–1.75
1-60s, 70s	1.90 –1.92½
2-60s, 70s	2.00 –2.05

FRENCH SPUN MERINO WHITE

1-30s, 50-50-58s on cops	$1.00 –1.02½
1-40s, 50-50-60s on cops	1.15 –1.17½
1-40s, 50-50-64s on cops	1.17½–1.20
1-40s, 50-50-64s Australian cops	1.20 –1.25

Underwear mixes, 3c. additional.
Solid color, 35c. additional.

◆

Tops and Noils

TOPS—BOSTON

Fine (64-66s)	$0.90–$0.92
Half-blood (60-62s)	.83– .88
High ¾ blood (58s)	.80– .82
Aver. ¾ blood (56s)	.75– .78
Low ¾ blood	.70– .73
High ½ blood (50s)	.65– .68
46s S. A. and N. Z.	.60– .63
44s S. A. and N. Z.	.58– .60
40s S. A. and N. Z.	.56– .58

TOPS—BRADFORD, ENG. (JAN. 30)

Fine (70s)	24½d	¾ bld. (56s)	15 d
Fine (64s)	22 d	½ bld. (50s)	12 d
½ bld. (60s)	20 d	Cross-bred (46s)	10 d
¼ bld. low (58s)	17 d		

NOILS—BOSTON

Fine	$0.43–$0.45	High ½ bld.	$0.31–$0.33
Half-bld	.38– .42	Low noils	.31– .33
Aver. ¾ bld.	.33– .35	Medium colored	.25– .28
Fine colored	.32– .35		

Wool Substitutes

WOOL WASTE

Lap, fine white	$0.68 –$0.70
Lap, fine colored	.48 – .52
Hard ends, fine white	.52 – .55
Hard ends, ¼ blood white	.35 – .38
Hard ends, fine colored	.25 – .27
Hard ends, medium colored	.18 – .20
Card, fine white	.23 – .27
Burr, fine Carbonizing	.30 – .33

OLD WOOLEN RAGS (GRADED FOR MFRS.)

Merinos, Coarse Light	$0.04½–$0.05½
Merinos, Fine Dark	.04 – .04½
Merinos, Fine Light	.11 – .12
Serges, Blue	.06 – .06½
Serges, Black	.06 – .06½
Serges, Red	.08 – .09
Knit, White	.23 – .24
Knit, red	.10½– .11½
Knit, Light Hoods	.11½– .12½
Worsted, Light	.05½– .06
Worsted, Blue	.06½– .07
Worsted, Black	.06½– .07

Silk Yarns

THROWN SILK (60 day basis)

	Nominal
Japan organzine, 2 thd. spec. gd. XX. sk. 85%	$4.45
Japan organzine, 2 thd. sp. crack. sk. 81%	3.95
Japan crepe, 3 thd. gd. XX bob. 83%	4.15
Japan crepe, 3 thd. sp. crack. bob. 81%	4.05
Japan crepe, 4 thd. crack bobbins, 78%	3.75
Japan grenadine, 4 thd. sp. grand singles, 87%	6.15
Japan grenadine 4 thd. 85%	5.90
Japan grenadine 3 thd. 90%	7.15
Canton crepe, 3 and 4 thd. ns. 14/16 on bobbins	2.95
Hosiery tram, 3 thd. Japan 90%	5.25
Hosiery tram, 5 thd. Japan, 85%	4.30
Hosiery tram, crack XX 78%	3.45

SPUN SILK YARNS (Terms: net 30)

40/2	$3.15	60/2	$3.35
50/2	3.25	62/1	2.35

Raw Silk

(60 day basis)
Prices Nominal

	13/15 White	20/22 White	20/22 Yellow
Super Grand, 86/88%	$3.80	$3.10	$3.20
Special Grand, 85%	3.35	2.95	3.05
Grand XX, 83%	3.15	2.90	3.00
Special Crack, 81%	2.95	2.80	2.90
Crack XX, 78%	2.90	2.75	2.85
Extra Extra, 73%	2.75	....	....
Best Extra, 68%	2 70	....	....

Canton filature, new style, 14/16	$1.85
Canton filature, new style, 20/22	1.65
Tussah filature, 8 cocoon	1.15

NATIONAL RAW SILK EXCHANGE

	Close Jan. 28	For the Week High	For the Week Low	Close Jan. 31	Net Chge.
February	2.67	2.67	2.53	2.63	—.04
March	2.62	2.66	2.57	2.63	+.01
April	2.58	2.65	2.57	2.65	+.07
May	2.58	2.65	2.53	2.57	—.01
June	2.51	2.62	2.54	2.56	+.05
July	2.53	2.57	2.50	2.54	+.01
August	2.55	2.57	2.50	2.54	—.01
September	....	2.57	2.52	2.53	....

Total contracts, 340. Total number of bales, 3,400.
Total approximate value, $10,030. Trading unit
Crack XX 13/15 white, 78%.

Domestic Rayon

VISCOSE PROCESS

Denier	Filament		First	Second
50	14		$2.15	$1.95
75	18–30		1.35	1.25
100	18–40		1.10	1.00
125	36–50		1.00	.90
150	30		.70	.67
150	40		.75	.72
150	60		.85	.82
150	75–90		.85	.82
170	24–27		.75	.72
170	60		.85	.82
200	30		.75	.72
200	35–42		.75	.72
300	42–62		.63	.60
450	54–60		.63	.60
600	72–96		.63	.60
900	100–144		.63	.60

NITRO-CELLULOSE PROCESS

Denier	First Qual.	Second Qual.	Denier	First Qual.	Second Qual.
75	$1.35	$1.25	150	$0.75	$0.72
100	1.05	.95	175	.75	.72
125	.95	.85			

CUPRAMMONIUM PROCESS

Denier	Filament	Price	Denier	Filament	Price
15	24	$3.10	65	45	$2.00
25	24	2.85	80	60	1.70
30	24	2.60	100	75	1.35
40	30	2.40	120	90	1.22
52	30	2.20	150	112	1.10
			180	135	.97

ACETATE PROCESS

Denier	Price	Denier	Price
45	$2.25 2.75	120	$1.90
55	2.05–2.55	140	1.30
65	2.45	150	1.40–1.85
75	1.80–2.70	200	1.55
100	1.65–2.45	300	1.50

Rayon Waste

Prices Nominal

Open bleached waste	–$0.13
Open unbleached waste	.11– .13
Bleached thread waste (mfs.)	.11– .11½
Bleached thread waste (misc.)	.05– .07
Colored thread waste	.03– .04
Colored clips	.03– .04

CONVERTED RAYON WASTE

Bleached tops	$0.40
Unbleached tops	.36
Bleached noils	.10
Bleached garnetts	.15
Unbleached garnetts	.14
Colored garnetts	.12

Silk Waste

Kibizzo Kakai Grand XX	$0.54
Kibizzo Kakai Triple Extra	.48
Frison Grand Double	.52½
Pierced Cocoons	.53